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ABSTRACT

A study investigated whether the writing outcomes of first-grade pupils participating in the Writing-to-Read (WTR) program differed significantly from the writing outcomes of pupils in a traditional language arts curriculum (No-WTR). The study also investigated whether differences were attributable to gender, race, socioeconomic status, individual learning style, attitude toward school, academic achievement, hours of language arts instruction or hours of writing instruction per week. Subjects were 149 first-grade pupils from two schools in one southern Mississippi public school district. Sixty-nine pupils from one school received WTR as part of their language arts curriculum. Eighty No-WTR pupils from another school in the district were sampled. Data included results from General Impression Marking, the learning style identification scale, a survey of school attitudes, and the Stanford Early School Achievement Test, level 1. Results indicated: (1) a significant difference between WTR and No-WTR writing outcomes; (2) varied writing outcomes according to race, individual student learning style, attitude toward school, and academic achievement; but (3) no significant difference according to gender and socioeconomic status. Results regarding hours of instruction were inconclusive but indicated that a possible relationship might exist between writing outcomes and time allocated to the writing process. (Twenty tables of data are included; 242 references, cover letters, letters to parents, letters to teachers, consent forms, and writing sample assessment instructions are attached.) (Author/RS)

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ED 361 704

University of Southern Mississippi

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by

Wanda Arleen Rumson Boyer

Abstract of a Dissertation
Submitted to the Graduate School
of the University of Southern Mississippi
in Partial Fulfillment of the Requirements
for the Degree of Doctor of Philosophy

CS213998

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Survey of School Attitudes, and the Stanford Early School Achievement Test, Level 1, were also employed in this study.

Multiple linear regression was used to discern the findings of this study. The results showed a significant difference between WTR and No-WTR writing outcomes. The effects of Writing to Read on first grade writing outcomes also varied according to race, individual student learning style, attitude toward school, and academic achievement. No significant difference between WTR and No-WTR writing outcomes was found according to gender and socioeconomic status.

Results regarding hours of instruction are inconclusive but indicate that a possible relationship might exist between writing outcomes and time allocated to the writing process. Thus, since the significant differences observed between WTR and No-WTR first grade writing outcomes were small, further research should attempt to distinguish the role of the expensive computer system and software from the role of increased hours of instruction.

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CHAPTER I

INTRODUCTION

The latter half of the twentieth century has been an era of unparalleled technological advancement in the history of the human race. A major catalyst of this pervasive progress was the invention of the digital computer in the mid-1940s. Since that time, the computer has proven useful in myriad fields including business, industry, government, science, mathematics, and education.

In education, the use of the computer to individualize and customize the learning process began during the 1950s when the International Business Machines Corporation Research Center connected a typewriter to an IBM 650 computer in order to test the theory of 'learning by self-instruction' (Baker, 1975). Pioneering research in computer assisted instruction continued at Stanford University during the 1960s. In 1965, a team of educators from Stanford University implemented a fourth grade mathematics curriculum using several "teletype machines connected to the Stanford computer by means of telephone lines. Forty-one pupils received daily [distance] drill-and-practice arithmetic lessons by this arrangement" (Baker, 1975, p. 21). In 1968-69, Suppes (1970) guided the implementation of computer-based reading instruction for grades one through three. The success of these projects led the Stanford researchers to install remote computer terminals in selected schools in Mississippi and eight other states.

The proliferation of computer-assisted instruction in the classroom began in the late 1970s with the advent of the microcomputer, which allowed less expensive implementation of curricula such as those developed at Stanford University. With continued research into computer-assisted instruction over the last decade, a novel conceptualization of the learning process has begun to unfold (Le, 1989). Thus far, the capstone of this evolution has been the opportunity for pupils to inquire, explore, and invent while divergently and independently employing the microcomputer and other interactive technology during the course of a school day (Schank & Farrell, 1988).

The potential of this new interactive microcomputer technology to create a scintillating and stimulating information-age environment has incited a great deal of interest (Cannings & Brown, 1986). Indeed, there is a growing advocacy for using computers in the classroom because "computers have become a deeply entrenched component of society" (Leonard & LeCroy, 1985, p. 3). At the state level in Mississippi, an education reform act entitled H. B. 1523 Mississippi's B.E.S.T. (Better Education For Schools Tomorrow) Education Act of 1990 was proposed. Among its many facets, this act specifically highlighted the need for educational innovation in Mississippi:

> Section 75-81. Creates a fifteen member Mississippi Task Force for Educational Innovation for reviewing education programs and recommending innovative programs (p. 13).

In light of this interest and commitment to technology-based instruction from the mid-1950s to the present, it is ironic that a sense of purpose and direction is still lacking in many North American classrooms: "The technological revolution appears to be sweeping around schools leaving them virtually untouched, even while purchasing microcomputers is becoming the 'in' thing for school districts to do" (Goodlad, 1984, p. 340). In their fervor to garnish early childhood classrooms with microcomputers, educators must also develop and effectively evaluate the quality of educational software (Leonard & LeCroy, 1986). To ensure the proper union of technology and instruction, research must precede innovation. Bennett (1976) surmises:

> ... it is a strange logic which dictates that we can afford to implement changes in organization and teaching which have unknown, and possibly deleterious, effects on the education of the nation's progeny (p. 9).

The Writing to Read program is an attempt to unite technology and instruction. Heeding Bennett's call for research, this study examined the effects of Writing to Read on the writing outcomes of 149 first grade pupils in a public school district in southern Mississippi. This in-depth study of the efficacy of the Writing to Read program was undertaken in order to offer direction for state-wide examination and possible state-wide implementation of Writing to Read. In addition, this investigation also identified some types of pupils whose writing proficiency was significantly influenced by participation in the Writing to Read program.

Statement of the Problem

The problem of the study was expressed by the following question: What are the effects of the Writing to Read (WTR) program on the writing outcomes of first grade pupils, and do those effects, if any, differ according to gender, race, socioeconomic status, individual student learning style, attitude toward school, academic achievement, hours of language arts instruction per week, or hours of writing instruction per week?

Purpose of the Study

The general purpose of this study was to determine if the writing outcomes of the first grade pupils in this study who experienced the Writing to Read (WTR) program as a part of their language arts curriculum were significantly different than the writing outcomes of the first grade pupils in this study who received a traditional language arts (No-WTR) curriculum. The ultimate goal of this study was to provide educators with insights into the efficacy of the Writing to Read program as an aid for improving composing skills.

A specific purpose of this study was to determine if the mean writing score of the first grade pupils in this study who had experienced Writing to Read was significantly different from the mean writing score of the first grade pupils in the traditional program. This study also sought to identify the types of pupils whose writing proficiency was significantly effected by participation in the Writing to Read program.

Hypotheses

The following research hypotheses were tested in order to ascertain the relationships in the problem statement.

H_1: There will be a significant difference between the writing outcomes, as measured by holistic scoring, of first grade pupils who have experienced the WTR program and those who have had No-WTR program experience while controlling for gender, race, socioeconomic status, individual student learning style, attitude toward school, academic achievement, hours of language arts instruction per week, and hours of writing instruction per week.

H_2: There will be a significant difference between the writing outcomes, as measured by holistic scoring, of first grade pupils who have experienced the WTR program and those who have had No-WTR program experience within at least one of the gender categories while controlling for race, socioeconomic status, individual student learning style, attitude toward school, academic achievement, hours of language arts instruction per week, and hours of writing instruction per week.

H_3: There will be a significant difference between the writing outcomes, as measured by holistic scoring, of first grade pupils who have experienced the WTR program and those who have had No-WTR program experience within at least one of the racial categories while controlling for gender, socioeconomic status, individual student learning style, attitude toward school, academic achievement, hours of language arts instruction per week, and hours of writing instruction per week.

H_4: There will be a significant difference between the writing outcomes, as measured by holistic scoring, of first grade pupils who have experienced the WTR program and those who have had No-WTR program experience within at least one of the socioeconomic status categories while controlling for gender, race, individual student learning style, attitude toward school, academic achievement, hours of language arts instruction per week, and hours of writing instruction per week.

H_5: There will be a significant difference between the writing outcomes, as measured by holistic scoring, of first grade pupils who have experienced the WTR program and those who have had No-WTR program experience within at least one of the individual student learning style categories while controlling for gender, race, socioeconomic status, attitude toward school, academic achievement, hours of language arts instruction per week, and hours of writing instruction per week.

H_6: There will be a significant difference between the writing outcomes, as measured by holistic scoring, of first grade pupils who have experienced the WTR program and those who have had No-WTR program experience within at least one of the attitude toward school categories while controlling for gender, race, socioeconomic status, individual student learning style, academic achievement, hours of language arts instruction per week, and hours of writing instruction per week.

H_7: There will be a significant difference between the writing outcomes, as measured by holistic scoring, of first grade pupils who have experienced the WTR program and those who have had No-WTR program experience within at least one of the academic achievement categories while controlling for gender, race, socioeconomic status, individual student learning style, attitude toward school, hours of language arts instruction per week, and hours of writing instruction per week.

H_8: There will be a significant relationship between first grade writing outcomes, as measured by holistic scoring, and hours of language arts instruction per week within the WTR or No-WTR groups, while controlling for gender, race, socioeconomic status, individual student learning style, attitude toward school, academic achievement, and hours of writing instruction per week.

H_9: There will be a significant relationship between first grade writing outcomes, as measured by holistic scoring, and hours of writing instruction per week within the WTR or No-WTR groups, while controlling for gender, race, socioeconomic status, individual student learning style, attitude toward school, academic achievement, and hours of language arts instruction per week.

Definition of Terms

The following definitions were offered to insure proper interpretation of the terminology used in this study.

WTR program. The term WTR program refers to a formal program entitled Writing to Read, which was designed by International Business Machines Corporation (IBM) and developed by John Henry Martin for kindergarten and first grade pupils. Thus, Writing to Read program experience refers to the Writing to Read instruction that the first grade pupils in this study received. The group of pupils in this study who experienced Writing to Read as a portion of the language arts curriculum are referred to as the WTR group, the experimental group, or the treatment group.

No-WTR program. The term No-WTR program refers to the traditional language arts curriculum received by those pupils in this study who did not experience Writing to Read. According to Fulwiler (1987), traditional language arts curriculum is defined as the use of textbooks and workbooks; this curriculum is referred to as the No-WTR program. The group of pupils who experienced the No-WTR program are collectively referred to as the control or No-WTR group.

Writing outcomes. The term writing outcomes refers to the writing scores assigned to the writing samples acquired from the first grade pupils in this study. The term writing sample refers to the product, written record, or result of a "sophisticated cognitive process in which the [first grade] writer acquires, organizes, and produces information" (Flood & Salus, 1984, p. 123). For the purpose of this study, writing scores were assigned by a panel of reviewers trained in the methodology of holistic scoring.

Holistic scoring. The term holistic scoring refers to "a quick, impressionistic qualitative procedure for sorting or ranking samples of writing" (Charney, 1984, p. 67). This study used a method of holistic scoring called General Impression Marking "in which the rater fits a writing sample into an ordered ranking on the basis of the total impression created by the paper" (Charney, 1984, p. 71). This technique is not designed to correct or edit a piece, or to diagnose its weaknesses. Instead, it is a set of procedures for assigning a value to a writing sample according to previously established criteria.

Gender. The term gender refers to the categorization of a pupil as either male or female. This information was obtained from pupil records.

Race. The term race refers to the categorization of a pupil according to cultural affiliation. For the purpose of this study, each pupil was identified as either black, white, or other. This information was obtained from pupil records.

Socioeconomic status. The term socioeconomic status refers to the categorization of a pupil according to social class affiliation. For the purpose of this study, the socioeconomic status of each pupil was identified through the lunch payment plan-- free lunch, reduced payment, or full payment. This information was obtained from pupil records.

Individual student learning style. The term individual student learning style refers to the "cognitive, affective, and psychological learning preferences that serve as relatively stable indicators over time of how individual learners perceive, interact with, and respond to the learning environment" (Keefe, 1982, p 44). Individual student learning styles were measured using the Learning Style Identification Scale (LSIS) (Malcom, Lutz, Gerken, & Hoeltke, 1981a, 1981b). For the purpose of this study, pupils were categorized as either Learning Style I, II, III, IV, or V.

Attitude toward school. The term attitude toward school refers to the reactions of the first grade pupils in this study to the school curriculum. The Survey of School Attitudes (SSA) (Hogan, 1975a, 1975b) was used to identify the attitudes of pupils toward reading and language arts, mathematics, science, and social studies. For the purpose of this study, pupils were categorized as having either low or high attitude in each of the four subject areas listed above. Thus, there are four low attitude toward school categories and four high attitude toward school categories.

Academic achievement. The term academic achievement refers to the following subtests sampled on the Stanford Early School Achievement Test, Level 1, (SESAT) (Madden, Gardner, & Collins, 1982b): (a) sounds and letters, (b) word reading, (c) listening to Words and Stories, (d) mathematics, and (e) environment. For the purpose of this study, pupils were categorized as having either low or high academic achievement on each of the five SESAT subtests. Thus, there are five low achievement categories and five high achievement categories.

Hours of language arts instruction per week. The term hours of language arts instruction per week refers to the amount of class time spent per week on language arts lessons such as writing, reading, listening, speaking, spelling, handwriting, and grammar.

Hours of writing instruction per week. The term hours of writing instruction per week refers to the amount of class time spent per week on writing lessons such as writing stories, poems, plays, narratives, and expository pieces. Note that writing instruction was included as a portion of the time allocated for language arts instruction.

Delimitations

The following delimitations were imposed by the researcher:

1. The study was limited to the writing outcomes and the perceptions of first grade pupils in two schools in one southern Mississippi public school district.
2. The study was limited to pupils who completed the Stanford Early School Achievement Test, Level 1, on April 17, 1989 while in kindergarten. Additionally, the study was limited to pupils who completed the Survey of School Attitudes and submitted a writing sample, and for whom a Learning Style Identification Scale was completed by the classroom teacher.
3. The study was limited to the following variables concerning the first grade pupils:
    3.01 WTR or No-WTR program experience
    3.02 gender
    3.03 race
    3.04 socioeconomic status
    3.05 individual student learning style
    3.06 attitude toward school
    3.07 academic achievement
    3.08 hours of language arts instruction per week
    3.09 hours of writing instruction per week
4. The study was limited to data collected from March through May of 1990.
5. All variables, conditions or populations not so specified in this study were considered beyond the scope of this investigation.

Assumptions

The following assumptions were expected to prevail throughout this study:

1. The participants were expected to be honest with their responses.
2. The participants were expected to accurately carry out the instructions provided by the researcher.

Organization of the Study

In Chapter I, the study is introduced, the problem and the purpose are stated, the research hypotheses are presented, the relevant terms are defined, the delimitations are explained, and the assumptions are outlined. A review of the literature related to this study is presented in Chapter II. The procedures and instruments used in the study are described in Chapter III. The data are presented and analyzed in Chapter IV. Chapter V contains the summary, conclusions, and recommendations of the study.

CHAPTER II

REVIEW OF RELATED LITERATURE

Introduction

The 'universe of language' is first introduced to an infant not in the environment of a classroom but via the child's emergent listening skills in a naturalistic setting (DeHaven, 1983). Through a series of small yet monumental steps, the infant is encouraged to elicit sounds and speech patterns in a variety of social contexts, thus learning the functions of oral language (Halliday, 1975). The impulse to communicate does not end with the child's ability to speak but extends to the heartfelt need to write, to reach distant audiences, and to exert the power of the pen (Graves, 1985).

Just as oral language learning begins when a child hears language, the impulse to write begins when a child is praised for holding and examining a pen or pencil that a significant other has used (Taylor, 1983). The inquiry, exploration, and learning continues when a young child is given the opportunity to hold a pencil to paper and make a non-trivial mark, dot, line, or scribble. Graves and Stuart (1985) indicate in Write From the Start

> Most adults think children can't write until they can read. But children can learn to write the same way they learn to talk, by going through a series of ever-improving approximations of what adults do. When children write first, reading comes more easily. (p. 2)

In affiliation with International Business Machines Corporation, John Henry Martin developed the Writing to Read program as a means of providing pupils with the opportunity to write first so that reading may come more easily. "What I can say I can write and what I can write I can read!" (Kirkland, 1984, p. 7). The philosophical premise espoused by Kirkland (1984) epitomizes the conceptual flavor of two decades of research in the writing process (Avery, 1987; Britton, 1967; Dobson, 1985; Emig, 1971; Graves, 1975; Graves, 1979; Graves, 1983). In order to evaluate the Writing to Read program in the context of past research and theoretical developments, this chapter will cover the following information:

1. a description of the Writing to Read program.
2. a selected review of the literature which discusses the writing instruction methodologies utilized by the Writing to Read program.
3. a selected review of studies performed over the past 6 years that examine the use of Writing to Read in kindergarten and first grade classrooms.
4. a critical analysis of the Writing to Read research.
5. an examination of General Impression Marking as used by Educational Testing Service for the evaluation of kindergarten and first grade writing outcomes.
6. a selected review of research performed over the past 25 years related to variables that can effect the writing outcomes of first grade pupils.
7. a summary of the contents of this chapter.

A Description of the Writing to Read Program

A computer and word processor program used in tandem have the potential of being an excellent aid in kindergarten and first grade writing because of the ease of editing errors and the ability to store, retrieve, and print compositions. In fact, the word processor in cadence with a vigilant teacher can enhance the flow of thinking by simplifying the mechanics of inserting, deleting, and changing written thoughts. Thus, the computer with appropriate software is a procedural rather than a structural facilitator of composition writing. The ideas for writing are pupil generated, and the substance of the pupil's work is not altered when the pupil employs the word processor and microcomputer in tandem (Cameron, Hunt, & Linton, 1987; Clouse, 1982; Martin & Friedberg, 1986; Scardamalia & Bereiter, 1986).

By employing a computer and word processor, the Writing to Read program "takes over much of the mechanical operation involved in the writing process and allows writers to concentrate on the thoughts, the semantics, [*sic*] behind the words" (Robinson, 1985, p. 84). However, Writing to Read is more than just a computer program-- it is a curriculum that teaches writing strategies. Thus, Writing to Read may also be classified as a tool for strategy instruction (Scardamalia & Bereiter, 1986).

The Writing to Read program offers kindergarten and first grade pupils the opportunity to acquire knowledge of the procedures involved in written composition and the strategies for writing more effectively using various modes of discourse (Hillocks, 1987). The curriculum design of the Writing to Read program is cyclical. For each of the program's ten major cycles, the pupil is introduced to three 'cycle' words that represent certain sounds, or phonemes, of the English language. The progression through a cycle involves the pupil in hearing, reading, and writing other words which also contain those phonemes. Finally, the pupil is given the opportunity to write stories using words spelled with the phonemes learned during the present and past cycles. In total, the pupil is introduced to 30 cycle words in the ten cycles:

1. cat, dog, fish
2. pig, sun, bed
3. rabbit, leg, three
4. man, snake, vase
5. jump, hand, wagon
6. yard, moon, kite
7. zipper, straw, smoke
8. turtle, chair, house
9. oil, horse, wheel
10. uniform, book, butter

These thirty words collectively contain the 42 phonemes of the English language (Martin & Friedberg, 1986, pp. 168-169).

The Writing to Read center is composed of five work stations. Pupils attend the center for about an hour each day, moving from station to station every 15 minutes. At each station the pupil is exposed to the same set or cycle of sounds and letters learned at the other stations. To master all of the words and phonemes in a former cycle, pupils may spend several days or a week moving through all of the stations in the center.

Work in the Writing to Read center begins at the computer station where pupils work in pairs. They select one of the three cycle words offered on the selection menu and the lesson for that word is then presented on successive computer screens. For example, in cycle 2 the pupils may choose to learn the cycle word pig; a picture of a pig appears and the following discourse ensues:

> This is a pig. See the word pig. Say pig. Say pig. This is the sound p, p. Say p, type p. Say pig. This is the sound i, i, say i. Type i. Say pig. This is the sound g, g, say g. Type g. Say pig. Say pig. Type pig. Say pig. Type pig (Freyd & Lytle, 1990, p. 84).

Next, the pupils may go to the work journal station where they listen to a taped lesson which reinforces the sounds previously learned. Each pupil then prints the phonemes and words featured in the lesson in a personal work journal or notebook. For example, given the cycle word cat, the pupil prints the phonemes c, a, and t, makes the sounds of the phonemes, and then creates the word as follows:

c
a
t
cat

On the second page of the work journal, the pupil writes and reads the cycle word three times. Finally, each pupil is given the opportunity to write in a personalized journal other words which contain the cycle word phonemes.

At the Make Words Station, each pupil is encouraged to think of other words which contain the phonemes previously learned. If the pupils have difficulty generating new words, then phoneme-based guessing games can be played to direct and focus their thinking. For example, words like fish, dig, tag, fig, and fit can be evoked with such questions as:

> What swims in the water?
>
> How do you make a hole in the ground?
>
> If we are playing a game and I ___ you, then you're it.
>
> What is something to eat that rhymes with pig?
>
> When we go to buy shoes, I always ask if the shoes ___ on your feet (Martin & Friedberg, 1986, p. 170).

Pupils can also play the Writing to Read bingo game and the Writing to Read make words game to increase word-building and sound recognition skills. If the pupils still have difficulty making new words, they are directed to repeat the procedure at the Work Journal Station. In addition, each pupil stays at the Make Words station until the new words are mastered.

At the Listening Library Station, pupils read silently along with the recordings of children's books. This experience provides pupils with the opportunity to see how words in books are separated by spaces and how words follow one another in a straight line. Pupils are also directed to look for capital letters which begin a sentence and for periods which end a sentence. The last station is the Writing/Typing station. Here pupils are encouraged to create their own stories using their own words, and spelling them according to the phonemes learned in the present and past cycles. The philosophical principles of writing instruction as espoused by the Writing to Read program are fostered and elaborated upon at this station. In order to further appreciate these instructional practices in writing, the next section will detail the writing instruction methodologies employed in the Writing to Read program.

Writing Instruction in the Writing to Read Program

The philosophy of the Writing to Read program is 'the more pupils write the more comfortable they become with the writing process' (Akins, 1988; Bissex, 1980; Bromley, 1988; Fulwiler, 1987; Hittleman, 1988; Moffet, 1981; Norton, 1989; Noyce & Christie, 1989; Rubin, 1990). Only by writing can pupils learn about the alphabetic nature and conventions of written English (Martin & Friedberg, 1986). The literature suggests that Writing to Read breaks from traditional kindergarten and first grade classroom practices in that daily writing is the rule rather than the exception (Freyd & Lytle, 1990).

Writing daily is a consistent practice in the Writing to Read program which enhances the developmental progression of pupils from pre-alphabetic practices to elaborate and personalized spelling and writing habits. The use of various writing instruction practices to meet varying developmental needs in the classroom underscores the fundamental belief of the Writing to Read program: "All children acquire language skills such as writing in the same order and sequence, yet the pace at which they learn is personal and idiosyncratic" (Kirkland, 1984, p. 5).

Due to these varying developmental writing propensities, some pupils may need to begin writing by combining words to form sentences and then employ sentence combining techniques to form longer compositions (Friedman, 1985, 1986; Mellon, 1978; Strong, 1986). Some pupils may need a picture to write about, a story starter such as 'I wish...', or simple questions encouraging them to elaborate upon what they have already written (Bromley, 1988; Clague-Tweet, 1973), and some pupils may need no help at all in order to create highly imaginative and coherent compositions (Martin & Friedberg, 1986). The process of learning to write is a very personal experience enhanced by programs that work. Writing to Read attempts to enhance each pupil's self-concept by allowing self-paced instruction: "I am the master of my own destiny... I did it myself... I finished the job and now I can go on to the next one [cycle]" (Martin & Friedberg, 1986, p. 76).

Writing to Read further supports this premise of individuality and seeks to enhance the self-concept of the learner by employing yet another instructional technique--free-writing. Torrence and Myers (1970) assert that free-writing allows the pupil to compose on a topic of the pupil's choosing. Writing enthusiasm is promoted by asking pupils to write about topics which interest them, rather than topics assigned by a teacher (Bissex, 1980). By giving open-ended topics, we ensure that "the writing is meaningful and purposeful from their point of view" (Dobson, 1983, p. 7). Writing, then, becomes "an active task that involves children in their own learning" (Dobson, 1985, p. 30).

Rosenblatt (1988) suggests that there is a link between the subject, the interests, the needs, the prior knowledge, and the curiosities of the writer:

> Thus the writing process must be seen as always embodying both personal and social, or individual and environmental, factors... This helps us place in perspective an activity such as 'free writing.' Instead of treating it as a prescriptive 'stage' of the writing process, as some seem to do, it should be seen as a technique for tapping the linguistic reservoir unhampered by anxieties about acceptability of subject, sequence, or mechanics... Such free writing may bring onto the page something that the writer will find worthy of further development... The essential point is that the individual linguistic reservoir must be activated (p. 9-10)

In her observations of her first grade classroom at George P. Way Elementary School in Bloomfield Hills, Michigan, Milz (1980) substantiates this contention: "[pupils] choose subjects that they are interested in and put the information into notes, letters, journals and stories when given the opportunity to do so" (p. 180). Avery (1987) noted that her own first grade pupils were "becoming responsible learners, and taking ownership of their learning, when I allowed them to choose their topics and seek answers to their own questions" (p. 617).

The rationale, then, for employing free-writing and open-ended topics is that pupils are encouraged to produce good writing on topics which interest them. Graves, Sowers, and Calkins (Graves, 1979) observed sixteen pupils extensively over a two-year period, analyzing the pupils' work and questioning them as they wrote. The authors noted that the pupils wrote about varying subjects, increased their writing production from one-liners to six page documents, were less fearful than they had been previously to write and to read their work, and, most importantly, their wording became more natural.

Mellon (1978) indicates that the extent to which pupil writing is self-sponsored (participant) rather than teacher-required (spectator) governs the extent to which pupil writers will undertake and persevere in productive composing behaviors. When given the opportunity to write on a variety of topics, pupils gain more confidence and are willing to experiment and explore in more detail and with more fervor than if the topics were imposed (Manning, Manning, & Hughes, 1987). When encumbered by a teacher/researcher selected topic, the pupil's ability to experiment and discover is severely restricted (King & Rental, 1979).

Unfortunately, Graves and Stuart (1985) have found that educators using traditional curricula assign writing topics that the pupils "know nothing about. Worse, they [educators] have them write about things they don't care anything about. The writing is for only one person, the teacher. It's written 'To Whom It May Concern'" (p. 38). Whale (1985) indicates that

> Writing across the grade levels in elementary and high school is usually a directed activity in which teachers assume responsibility for stimulating students to write. Teachers decide the nature of the writing task, the time of day, and the length of time to complete the writing. Such control suggests that teachers need to be knowledgeable about the kinds of writing tasks they set. Two factors must be considered here. If teachers focus on a restricted number of topics and modes of writing, the students may have a limited understanding of what writing is, what it is for and how they can use it for their own purposes. If school writing represents the only writing students do this understanding of the functions of writing is limited even further (p. 3).

These concerns about quantity of writing instruction time, developmental propriety, and restrictions of teacher assigned topics were the motivating force in the development of the Writing to Read program. To shed light on the efficacy of these facets of Writing to Read, the next section will review past research which evaluates the Writing to Read program's ability to improve and enhance writing proficiency.

Studies on the Writing to Read Program

The Writing to Read educational program was designed to develop the pupil's reading skills through his own writing. "When the materials being read are expressed in the pupil's language and rooted in his/her experiences, the pupil has the schemata to comprehend the material" (Reeves-Kazelskis, Kazelskis, & James, 1987, p. 89). With this theoretical construct in mind the Writing to Read program is not merely a computer program, but a complex methodology designed to teach a phonemically consistent alphabet. The emphasis is on encouraging early childhood pupils "to find their way into print and publishing without going through the workbook approach to prove their readiness" (Willinsky, 1985, p. 2).

The interest in the Writing to Read program is based in part on the extensive literature which links the writing and reading process (Birnbaum, 1980; Graves, 1980; Page, 1975; Read, 1975; Roskelly, 1988; Wallace, 1985), and in part on the apparent success of the program involving learners of varying intellectual capabilities, e.g. educable mentally retarded, learning disabled, and the gifted (Charp, 1989; Clouse, 1982; Dobson, 1985; Kirkland, 1984; Lindsay, 1986). Despite the evidence which links the reading and writing processes, most of the research related to the Writing to Read program has focused on reading achievement (Blum & Furlong, 1983; Deboe, Ingebo, Leonard, Moilanen, Williams, & Yagi, 1984; Kirkland, 1984; Ohanian, 1984; Partridge, 1984; Spillman, Hutchcraft, Olliff, Lutz, & Kray, 1984; Wallace, 1985; West, 1985; Whitmer & Miller, 1987); however, a number of studies of the effect of Writing to Read on writing ability are reported in the literature.

Educational Testing Service (ETS) performed a study of the Writing to Read program in 1984. Writing samples from WTR and No-WTR groups in both kindergarten and first grade were collected by the teachers. The samples were sent to ETS and scored by a panel of teachers trained in the ETS developed scoring procedure called General Impression Marking, which is a variant of the holistic scoring technique (Educational Testing Service, 1984). From this study of 793 kindergarten pupils at 14 sites and 52 pupils at 1 site, Educational Testing Service (1984) observed that

> Writing to Read children clearly surpass comparison students in writing performance. This appears to be true across both kindergarten and first grade, in groups of children who completed Writing to Read last year, and across differing populations based on sex, race, and socioeconomic status. When we adjusted differences for initial skills of Writing to Read and Non-Writing to Read children, the Writing to Read children still perform significantly better than their peers (p. 3).

Charney (1984) notes, however, a criticism of the Educational Testing Service (ETS) study is the use of open-ended topics rather than assigned writing topics. By using open-ended topics, Charney argues that ETS cannot account for varying levels of complexity in the pupils' writing. Thus, a pupil may score higher on one particular writing sample because of background knowledge, or score lower simply because he chose a more difficult topic or style of discourse not in keeping with his academic level. While Charney's philosophy applies to the analysis of various literary forms composed by high school and college students, it is inappropriate for primary grade pupils. In most cases, these pupils do not have the complexity of thinking required to adequately assess their writing, and, furthermore, they have not yet developed the advanced styles of discourse demonstrated by older students (Crowhurst, 1988, p. 37). Indeed, with only an average of 24 phonetically spelled words per 15 minute writing sample (Leahy & Zennie, 1988), this age group is just chipping the iceberg of descriptive writing.

In an evaluation of the District of Columbia Public School's use of the Writing to Read (WTR) program during the 1985-1986 school year, the District of Columbia Public School's Division of Quality Assurance (1986) investigated the effects of the Writing to Read program on kindergarten and first grade writing outcomes. The WTR schools were randomly selected and matched to the No-WTR schools on socioeconomic status, which was determined by free lunch status, school size, and grades 3 and 6 test score information; the test name was not specified. In both kindergarten and first grade, one writing sample from each pupil was collected in December and one in May; all samples were assessed on a holistic scoring scale of 1 (low) to 10 (high). There were 411 WTR and 128 No-WTR kindergarten pupils in the December sampling, and 319 WTR and 137 No-WTR kindergarten pupils in the May sampling. The authors did not indicate the first grade writing sample sizes. In the December kindergarten sampling, WTR writing samples had a mean of 2.3, while No-WTR samples had a mean of 1.71. In the May kindergarten sampling, the WTR group had a mean of 4.84, while the No-WTR group had a mean of 2.84. In the December first grade sampling, the WTR group had a mean of 4.19, while the No-WTR group had a mean of 2.56. In the May sampling, the WTR group had a mean of 6.91, while the No-WTR group had a mean of 3.68. The authors state that "in all cases, the means of the Writing to Read students were at higher stages than those of the comparison groups, with significant differences shown in the analyses" (p. 19). While this statement is meant to show the superiority of the Writing to Read program, the fact that the writing scores of the WTR pupils were significantly higher on both the pre-test and post-test simply underscores the need to account for other intervening variables. Hence, the differences in mean scores cannot be attributed to the Writing to Read program without further study.

In an 'evaluative report' of the Writing to Read program, Moilanen (1986) studied 386 WTR kindergarten pupils in the Portland Public Schools of Portland, Oregon. At the beginning of the year, the 386 pupils were divided into three groups based on teachers' reports: the 33 'advanced' pupils had typically "begun to read and write" (p. 56); the

247 'ready' pupils had some "preliminary knowledge of the alphabet and sound-symbol relationship [sic]" (p. 56); the 106 'not ready' pupils had "neither a preliminary knowledge of the alphabet, nor levels of motor skill development and attention span teachers perceived to be required for successful participation in the Writing to Read program" (p. 56). At the end of the year, one writing sample was collected from each pupil and evaluated using the PPS Rating Scale developed by the Portland Public School system. The 'not ready' group had a mean composition rating of 1.87, the 'ready' group had a mean composition rating of 3.68, and the 'advanced' pupils purportedly averaged 5.90 on the 0-5 point PPS Rating Scale. Aside from one group having an average above the highest possible score, there were several other problems that delimit this study from a true evaluation of Writing to Read. First, there was no control group, so no comparison with traditional curricula could be made. Second, there was also no pretest, thus prohibiting a discussion of any change which might have been due to the Writing to Read treatment.

Spillman, Hutchcraft, Olliff, Lutz, and Kray (1986) studied the effects of the Writing to Read program in six Lee County, Florida schools. The WTR schools were matched to No-WTR schools on the basis of lunch status, minority and migrant populations, and on similar academic scores among first graders as measured by the California Achievement Test from 1981-83. The 110 kindergarten and 193 first grade WTR pupils and the 130 kindergarten and 133 first grade No-WTR pupils' writing samples were evaluated on all of the following: (a) mean number of communication units, or independent clauses and their modifiers (c-units), (b) the mean words per c-unit, (c) the total number of words produced, and (d) the total number of correctly spelled words. According to the authors, the WTR kindergarten pupils produced an average of 1.57 c-units, while the No-WTR kindergarten pupils produced an average of .29 c-units. The first grade pupils produced an average of 3.81 c-units, and the No-WTR first grade pupils produced an average of 2.30 c-units. Additionally, the WTR kindergarten pupils used an average of 3.98 words per c-unit, while the No-WTR kindergarten pupils produced an average of 1.00 words per c-unit; the first grade WTR pupils produced an average of 6.22 words per c-unit, while the first grade No-WTR pupils produced an average of 5.25 words per c-unit. The average total word production of the WTR kindergarten pupils was 10.17 words, while the No-WTR pupils produced an average of 2.61 words in total; the first grade WTR pupils wrote an average of 24.62 words in total, while mean total word production of the first grade No-WTR pupils was 16.07 words. In both the kindergarten and first grade samples, the mean score of the WTR group was higher than the mean score of the No-WTR group. One point that the authors leave unclear is their method for calculating total word production. For example, the average WTR kindergarten pupil produced 1.57 c-units at the rate of 3.98 words per c-unit; this would seem to indicate a total word production of 1.57 x 3.98 = 6.25 total words, rather than the 10.17 total word production average stated in Table 2 on page 13 of the author's research. Another limitation of this study was the authors' focus on the average number of c-units and word production as an example of written language proficiency in young children rather than an analysis of content (Hogan & Mishler, 1982).

Brierley (1987) studied the effect of Writing to Read on half-day and full-day kindergarten programs in the Columbus, Ohio Public Schools. The pupils were divided into four groups: one group of 186 pupils who received Writing to Read during the half-day kindergarten program another group of 93 pupils who attended a half-day kindergarten program which did not include Writing to Read; a third group of 44 pupils who received Writing to Read in a full day kindergarten program; and a fourth group of 155 pupils who did not receive Writing to Read during the full-day kindergarten program (p. 20). According to the authors, pupils enrolled in the half-day WTR program averaged 2.6, while the pupils in the half-day No-WTR kindergarten program had a mean writing score of 2.3. The pupils enrolled in the full-day WTR program averaged 3.6, while the pupils in the full-day No-WTR kindergarten program had a mean writing score of 2.9. Despite the reported differences in writing scores, the design of Brierley's study prohibits an assertion that Writing to Read was responsible for any effect inasmuch as the authors made no mention of technique for filtering outside influences and uncontrolled variables.

In the Hillsborough County Public Schools of Tampa, Florida, Haines and Turner (1987) investigated the effect of the Writing to Read program on kindergarten pupils' writing gains. The 72 pupils in the WTR group were matched on the basis of sex, race, lunch plan, and Dallas scores (the Dallas is a test of developmental readiness) to 72 No-WTR pupils. Using holistic scoring, the pupils' writing samples were rated on a scale from 0 (low) to 6 (high). The WTR group averaged 2.71 while the No-WTR group averaged 1.34 (significant at 0.0001 level). The WTR males averaged 2.87 while No-WTR males averaged only 0.63 (significant at the 0.0001 level). The WTR females averaged 2.58 while No-WTR females averaged 2.10 (not significant at the 0.276 level). Of the pupils in the mid-socioeconomic status, those in the WTR group had an average score of 2.96 while those in the No-WTR group had an average score of 1.39 (significant at the 0.0001 level). In contrast, the WTR pupils in the low socioeconomic status had an average score of 1.15 while the No-WTR pupils had an average score of 0.93 (not significant at the 0.625 level). With regard to academic achievement, high ability WTR pupils averaged 3.74 while the high ability No-WTR pupils averaged 2.35 (significant at the 0.008 level). The average ability WTR pupils averaged 2.59 while the average ability No-WTR pupils averaged 0.85 (significant at the 0.0001 level). Low ability WTR pupils averaged 1.50 while low ability No-WTR pupils averaged 0.55 (significant at the 0.014 level). Haines and Turner attribute all of the significant results to the kindergarten teachers' report, which indicated that they spent more time on writing than in the years before WTR.

In evaluating the effects of the Writing to Read program in the Fort Worth Independent School District of Fort Worth, Texas, Naron and Elliot (1987) compared the writing samples of selected pupils from 24 classrooms: 10 WTR classrooms, 10 traditional classrooms which utilized textbooks, and 4 Writing Process classrooms which focused on the sequence of writing. The authors selected a number of kindergarten, first grade, and multi-age groupings of four- and five-year-old children; however, they did not specify the exact number of pupils in each of the four categories. The authors also eliminated bilingual and English as a Second Language classrooms from the study. The selected schools and classrooms were matched on socioeconomic status and ethnic makeup of the pupils. However, due to a shortage of writing process classrooms, two of the four were selected from the Arlington school district. The authors stated that no tests of significance were conducted due to the limitations of this research. Nevertheless, they report finding a trend in the kindergarten writing samples: "the data indicated that WTR pupils scored the highest, WP next highest, and the students from the traditional classes scored the lowest on the writing assessment" (p. 22), but not in the first grade writing samples. The authors attribute this finding to the socioeconomic status of the pupils. The authors also report that the first grade writing process (WP) pupils scored higher than both the first grade WTR and first grade traditional pupils.

In an evaluation of the District of Columbia Public School's use of the Writing to Read (WTR) program, Gold and McKenzie (1988) studied the effects of the program on kindergarten and first grade writing ability. The study involved 86 WTR kindergarten pupils, 155 No-WTR kindergarten pupils, 130 WTR first graders, and 152 No-WTR first graders. The writing skill levels of the pupils were assessed by scoring their writing samples using a ten point "writing scale developed by Dr. Deloris Saunders, [a] consultant for Writing to Read" (p. 13). According to Gold and McKenzie, the Writing to Read program produced a significant effect on kindergarten and first grade growth in writing: "students advanced in terms of the level of skill in writing from the collection of the pre-writing sample to the post-writing sample" (p. 19).

Leahy and Zennie (1988) conducted a study of the Writing to Read program in the Kettering City schools of Dayton, Ohio. While no mention was made of the numbers of pupils in the first and second grade classes studied, the authors stated that "two classes at each grade level participated in the Writing to Read program while the other two classes did not participate [sic]" (p. 3). The grade one pupils received the Writing to Read treatment in the 1987-88 school year, and the grade two pupils were enrolled in the Writing to Read program during their grade one year (1986-87). Leahy and Zennie (1988) found that Writing to Read pupils in both grades exhibited greater written fluency based on the fact that they produced more words, on the average, than the No-WTR pupils. However, it should be noted that neither the literature nor statistical research to date support a correlation between fluency and the raw number of words a pupil uses in a writing sample (Hogan & Mishler, 1982). Leahy and Zennie (1988) recognized this problem when they stated that a more qualitative measure of writing is required in order to note growth in writing fluency from the first to the second grade, which was not found to be significant using their measuring techniques.

Leahy (1989) summarized the effects of the Writing to Read program in the Kettering City schools of Dayton, Ohio during the 1988-1989 school year. This study continued the work done by Leahy and Zennie (1988) as cited above. However, this summary does not offer the reader the number of subjects studied in this research, nor the numeric differences between the WTR and the No-WTR groups on the Competency Based Writing samples, nor a description of the Competency Based Writing sample. Furthermore, no scores were given to identify the numeric difference between the WTR and No-WTR groups on word production. The author summarized the results of the study as follows. "Differences between the WTR and No-WTR groups of students at both grade levels" (p. 8) were evident according to rating measures on the Competency Based Writing samples. WTR pupils in first and second grade scored significantly higher on word production than No-WTR pupils. According to the mean rating on the Competency Based Writing samples, the WTR grade one and two pupils scored significantly higher than the No-WTR pupils.

In a two year evaluation of the Writing to Read program in Community Consolidated School District #65 (no city or state was mentioned), Levinson and Lalor (1989) studied the writing outcomes of 466 kindergarten and first grade pupils. The writing samples were rated "on a four point scale: 4 - inadequate; 3 - basic; 2 - good; 1 - excellent" (p. 4). In the first year, there were 76 WTR and 66 No-WTR kindergarten pupils and 56 WTR and 74 No-WTR first grade pupils. The authors found that 45% of the WTR kindergarten pupils and 52% of the WTR first grade pupils received scores of good or excellent; 11% of the No-WTR kindergarten pupils and 51% of the No-WTR first grade pupils received scores of good or excellent. Given the nearly identical performances of the WTR and No-WTR first grade pupils, the authors note that "a more rigorous analysis was undertaken in the second year of implementation" (p. 4) because "pretest differences were not accounted for in this first year analysis" (p. 4). In the second year, there were 47 WTR and 65 No-WTR kindergarten pupils and 42 WTR and 40 No-WTR first grade pupils. The authors found that 53% of the WTR kindergarten pupils received a score of good or excellent, but only 12% of the No-WTR kindergarten pupils received a score of good or excellent. Of the first grade pupils, 71% of the WTR pupils and 54% of the No-WTR pupils received a score of good or excellent. The authors note that the differences found in the first grade pupils' scores

> were not statistically significant at the .05 level... However, given the higher pretest scores of the control [No-WTR] group, one can speculate that the trend toward better papers in the experimental [WTR] group may be more than a trend, rather a difference (p. 6).

The aforementioned research studies failed to conclusively isolate a causal relationship between the use of the Writing to Read program and improvement in writing outcomes. Aside from the individual shortcomings of each study, several enigmas seem to pervade the Writing to Read research. The next section will discuss these concerns in detail.

A Critical Analysis of Writing to Read Research

In their survey of the Writing to Read research, Freyd and Lytle (1990) offer a plethora of alternative explanations for any significant effects noted in much of the Writing to Read research:

> At an obvious level, there is the likelihood of Hawthorne effects at any WTR site, particularly in

> the early years of implementation. Another possibility is that early WTR sites are in schools or districts supportive of innovation... [Also,] Since most WTR classrooms have at least one additional staff member in the room, and often two, any effects attributed to WTR could result from reduced pupil-staff ratios and concomitant increased time-on-task... [Lastly,] the most glaring oversight in interpreting the results of the [WTR] studies is the failure to acknowledge that when students are spending time writing, whether or not on computers, they are receiving language instruction different from that of most kindergarteners and 1st graders (p. 86).

Another alternative explanation for variation in the writing outcomes among kindergarten and first grade pupils may arise as a result of variation of implementation practices within the classroom. As indicated by Freyd and Lytle (1990), any omission or adaptation of the Writing to Read program by the classroom teacher could affect a true picture of the program. Proper implementation of the Writing to Read program requires teacher devotion to the whole process. Implementation of the entire program entails the allocation of one hour a day for five days and the incorporation of all five stations-- a computer station, a work journal station, a listening library station, a typing station, and a make words station-- into the language arts curriculum.

Another factor which Freyd and Lytle (1990) note is the fact that the previously mentioned authors did not consider and then control for any outside influences on the writing performance of their subjects. Shavelson (1988) highlights the importance of neutralizing "the effects of variables which are not of central focus to the study but which may affect the observed behavior" (Shavelson, 1988, p. 16). In this case, the observed behavior to be studied is first grade writing outcomes. Therefore, anything which does not deal with writing outcomes, but which may influence the pupils' writing outcomes, must be controlled. Variables such as gender, race, socioeconomic status, individual student learning style, pupil attitude toward school, and academic achievement are variables which may influence a pupil's ability to produce clear, fluent writing within a pre-established time frame (Graves, 1975; King, 1978; Milner, 1983; Price, 1977; Romatowski & Trepanier-Street, 1987; Yore, Collis, & Ollila, 1988).

In order to provide conclusive research on Writing to Read, a concerted effort must be made to control outside influences and to effectively evaluate first grade writing. Many of the studies above merely counted the number of words or c-units produced rather than evaluating the content and style of writing. The following section will discuss General Impression Marking and its impact on the evaluation of writing samples.

General Impression Marking

The establishment of a rationale for the use of General Impression Marking mandates a more detailed preface of the stages of writing development. In a June 27, 1984 Educational Testing Service (ETS) 'Report of the Meeting,' Fowles admonishes that judgments about development and expression require a prerequisite understanding of intellectual and language development of the first grade pupil. In order to judge the product, the stages of the writing process must be understood (Manning, Manning, & Hughes, 1987).

According to Hurst, Dobson, Chow, Nucich, Stickley, and Smith (1983), there are four stages of writing development: the Pre-Communicative Stage, the Semi-Phonetic Stage, the Phonetic Stage, and the Transitional Stage. Communication in the Pre-Communicative Stage can take an alphabetic and non-alphabetic form. At this stage there is no message intended, writing and drawings are unrelated, and the message is conveyed through a word or phrase. A pupil in the Semi-Phonetic Stage cogently employs letters to represent words or parts of words to convey their message. In the Phonetic Stage of development, the pupils will display their knowledge of letter-sound correspondence. However, they do not always use vowels and consonants as one would expect and reversals are still common. In terms of meaning, the pupils at this stage "will relate their own experiences or events that are important to them" (Hurst, Dobson, Chow, Nucich, Stickley, & Smith, 1983, p. 12). The Transitional Stage is a movement from the reliance of sound representations of the words to a reliance on visual or morphophonemic representations which incorporate aspects of grammar and meaning (Hurst et al, 1983; p. 13). Pupils at this latter stage write much more than in previous stages.

Knowing these stages of writing development can lead to a more enlightened understanding of the spectrum of writing abilities one may see in a first grade classroom. A pupil's writing acumen will dictate how he moves from a vocabulary of two thousand words to a vocabulary of four thousand words, and from oral speech to written text (King & Rental, 1981). Pursuant to the goal of expedient developmental advancement of young writers is a need for determining instantaneous writing ability through evaluation of writing samples. Without this ability to rate a pupil's writing at one instant in time, a researcher will be unable to monitor the pupil's progress through comparison with subsequent ratings. Without a technique for evaluating writing samples, a researcher will be unable to establish dependence of writing proficiency on various writing curricula.

Despite the plainly apparent value of the evaluation process, the methods employed to evaluate writing have been far from expedient (Odell, 1977). In fact, until the 1950s and 60s quantitative studies of writing had been used as an adjunct or addition to standardized tests. What was tested was the number of grammatical errors, the number of t-units, or the number of uncommon vocabulary items in a writing sample. This method of evaluation proved "insensitive to a student's ability to write cogent, coherent and fluent prose" (Charney, 1984, p. 67).

Researchers and evaluators are now realizing the potential of the qualitative evaluation procedure called holistic scoring (Myers, 1980). Educational Testing Service (ETS) extended this concept of holistic scoring with General Impression Marking, which is a method of holistic scoring that allows for open-ended topics. The scores assigned to pupils' writing samples reflect the scorers' assessment of the quality of content and mechanics in the writing samples; this quantitative measure can serve as a dependent variable in composition research (Diederich, 1974). General Impression Marking scores reflects the diversity of writing abilities in any classroom, thereby assisting the teacher to make pupil centered decisions about writing instruction.

Researchers have found that this method can be easily and quickly administered and is reliable (Thornton, 1989). In fact, Horner (1978) suggests holistic scores can reveal

> how well an individual student's writing compares to the group's and they reveal how well the group writes as a whole. Scores converted to simple percentages tell what proportion of a group falls into each of the four classifications: poor, below average, above average, and excellent (p. 61).

However, consideration must be given to the statistical reliability of the ratings of a qualitative measure such as holistic scoring. Of particular concern is the assurance of score reliability. The viability of the scores is greatly enhanced by using a number of separate readings to ensure intra-rater and inter-rater reliability (Charney, 1984). In terms of rating reliability scores will be consistent and considered more valid among competent judges of writing samples who have comparable education backgrounds and who who have been trained in the methods of Holistic scoring (McColly, 1970).

Fortunately, teachers new to General Impression Marking can be quickly and easily trained to score holistically (Bertrand, 1983; Hailey, 1978; Hogan & Mishler, 1982; Myers, 1980; Texas Education Agency, 1980). Fowles (1984) substantiates this viewpoint in chronicling the training of 31 first-grade teachers from public and private, urban, suburban, and rural schools in New Jersey and Pennsylvania and identifies four major considerations: (a) The readers should be given a chance to personally review the pre-established directions for administering the story starter; (b) the participants are to be informed that handwriting, spelling, and punctuation should not influence their evaluation of the pupils' writing; (c) the readers should be given a trial run in order to establish inter-rater reliability and to verbalize to the other readers why a paper is good, average or poor; (d) the General Impression Marking criteria should then be presented to readers at this time in order to note the parity between their ad hoc evaluation systems and the criteria presented by Educational Testing Service. Fowles (1984) noted that "after scoring and discussing approximately 25 essays in the course of an hour, the readers seemed able to apply the criteria with assurance" (p. 3).

With General Impression Marking, researchers can acquire statistically valid evaluations of large numbers of writing samples easily. With the ability to obtain consistent writing scores, the only remaining task in isolating the effect of Writing to Read is to account for outside influences which may effect writing outcomes. The next section discusses available literature on the selected variables which may impinge on writing acumen.

The Influence of Selected Variables on Writing Outcomes

Writing is one of the most pervasive modes of expressing thoughts and ideas and is a "valued outcome of schooling" (Clark & Florio-Ruane, 1984, p. 5). Learning to write is a challenge which must be met despite the many possible influences which can effect pupil writing outcomes (Graves, 1975). In order to justify inclusion of selected variables as outside influences which must be controlled in order to isolate the effect of Writing to Read on writing outcomes, a review of the literature was conducted on the relationship between writing outcomes and the selected variables of gender, race, socioeconomic status, individual student learning style, attitude toward school, academic achievement, amount of language arts instruction time per week, and amount of writing instruction time per week. Note that the actual effects of these variables on writing outcomes is not relevant to this study, but that the effects of Writing to Read on writing outcomes cannot be isolated without accounting for these variables. In addition, the effects of Writing to Read within the context of these variables is also relevant to this study since such information can help to identify the types of pupils whose writing proficiency is significantly effected by Writing to Read.

Gender

Much of the literature regarding gender deals with gender specific oral language skills which are modified and contoured according to sex roles (Durkin, 1986; Morrison, 1984; Sternglanz & Serbin, 1974; Stewig, 1982) and children's awareness of these oral language differences between boys and girls (Hendrick, 1986; Minuchin, 1965; Tobach & Rosoff, 1978; Yolles, 1971). There is some basis for investigation into gender differences because "women travel on different developmental paths, but the Piagetian concept still holds sway in the field" (Milner, 1983, p. 3).

Griffin (1966) analyzed the language of 180 white middle class kindergarten and elementary school pupils (k, 1, 2, 3, 5, 7). Through analysis of the mean length of t-units (sentences), the author found that the t-units increased proportionally with grade level; the most significant increase in t-unit mean length occurred in grade 5. The t-unit mean length in girls' writing was greater than the t-unit mean length in boys' writing in all grades except grade 7. This study showed a difference between boys' and girls' writing, but, as with the study by Leahy and Zennie (1988), no assertions about writing quality can be made by examining sentence length.

Graves (1975) exhaustively examined the writing process of eight seven-year-old pupils (six boys and two girls) over a five month period in order to examine developmental issues and issues of individual differences. In this naturalistic investigation, Graves found that girls wrote longer documents and focused on the assigned topics; boys wrote more unassigned topics. The latter result led Graves to hypothesize about the kind of work that early childhood teachers assign, speculating that there is a preponderance of female teachers whose assigned writing topics focus on primary territory or topics of a personal nature. The young girls in the class are more comfortable with the writing process and write longer stories related to home and school. However, since most young boys have an affinity for extended geographical territory, they have less to say about most of the writing topics they are assigned; thus, they are less involved in the writing process, write less and will habitually veer off topic. The developmentally advanced girls were able to write on secondary and extended territory topics, and developmentally advanced boys are able to use the first person form. From his observations, Graves noted that boys are more concerned than girls with the "importance of spacing, formation of letters, and neatness in expressing their concept" and that girls "stress more prethinking and organizational qualities, feelings in characterizations, and give more illustrations [i.e. analogies] to support their judgments than do boys" (p. 236). This has obvious ramifications for the General Impression Marking of writing samples as the writing qualities boys purportedly manifest are not considered criteria for the evaluation of writing samples.

In observing her son Paul's writing development, Bissex (1980) concurs with the findings of Graves, saying "in contrast to the varied forms of Paul's spontaneous writings, his school writings were structurally monotonous" (p.57). Bissex hypothesized that this difference was caused by the changed conditions under which Paul was writing: "Instead of writing by himself, he was writing in a group. Instead of writing when he had something in particular he wanted to write, he wrote during writing periods" (p. 59). Bissex surmises, as Graves did, that "perhaps the dominance of women among primary grade teachers has contributed to a narrowness and stereotyping of forms we expect children to write in (stories, poems, letters, personal accounts)" (p. 111).

The research of Romatowski and Trepanier-Street (1987) supports the contention of gender differences. They studied 90 boys and 90 girls in grades one through six from both private and public schools in a large metropolitan district.

The pupils represented varied racial, ethnic, and socioeconomic backgrounds. The authors found that, in general, there was a predominance of male characters in the story writing of both males (86%) and females (76%) across grades one through six. Male dominance was particularly evident in the writings of grade 1 to 4 pupils; the male characters were described in longer and more detailed stories, were often more aggressive and less emotional, received more action-packed roles, and were given a greater variety of occupations than female characters.

Several other studies found similar results to those of Romatowski and Trepanier-Street cited above. Ollila, Bullen, and Collis (1989) studied 450 first grade pupils. These pupils were asked to imagine that they were animals and to write about themselves. Girls tended to characterize themselves as animals that were weak, safe, or tame. Boys aligned themselves with animals they characterized as strong, dangerous, or wild. In a study of 416 elementary school pupils, Ponzetti and Folkrod (1989) asked pupils to write what they thought of their grandparents. The authors found that girls were more likely than boys to mention love. In an evaluation of the Writing to Read program, Haines and Turner (1987) found that writing samples from male WTR kindergarten pupils scored higher on the six point General Impression Marking scale (Fowles, 1984) than did writing samples from female WTR kindergarten pupils.

As a result of the literature cited above, the effects of gender within the context of the curriculum cannot be ignored. In particular, how is the writing proficiency of males and females effected by Writing to Read?

Race

Most of the literature regarding the purported influence of race and culture has focused on oral language development (Lein, 1975; Michaels, 1980; Piestrup, 1973) and on reading skills (Allington, 1980; Brophy & Good, 1969; Canney & Winograd, 1979). Research regarding race and writing was limited in the literature.

Milner (1983) asserts the universality of language development: "all humans given an adequate set of psychological equipment and a fair environment will move through the hierarchy in spite of their particular cultural [affiliations]" (p. 3). In terms of general learning, Oldenquist (1985) indicates that all "children feel good about themselves when they feel they are actually learning things, acquiring skills, and participating with others in serious, structured activity" (p. 257).

Dyson (1987) studied a boy of Black/Anglo descent, a Hispanic boy, and a white girl. All three young pupils had different styles of writing. The author noted that the Black/Anglo boy relied heavily upon social contact, 'talking' as he drew his stories and then writing about what he had drawn. His pace was moderate, and he learned to spell a number of frequently used words. The Hispanic boy wrote adventure stories which were more narrative than the stories of the other boy. The little girl wrote many stories about her family and friends which were neat but lacked variety.

Although Dyson's research would seem to indicate an effect on writing due to race, many researchers contend that it is the environment provided by a cultural group that often causes the deficiency in language development; specifically, cultural groups which rely heavily upon oral rather than written communication will often produce pupils with lower levels of academic literacy (Labov, 1977). In fact, Manning, Long, and Manning (1989) found that confidence in writing is also related to social class differences, not race.

In the end, educators must note that all pupils do not receive the same opportunities to learn at home, yet they must still be educated; thus, it is important for researchers to identify differences which do exist, regardless of cause, in order to develop the best possible curriculum (Hymes, 1979).

Socioeconomic Status

The question of adequately defining the term socioeconomic status has been the cause of great divergence in the content of the literature (Hale-Benson, 1986;

Havighurst, 1976). In order to unify the discussion of socioeconomic status, this definition will be employed:

> [Social class] is a segment of a population whose members hold a relatively similar share of scarce desirables and who share attitudes, values, norms, and an identifiable lifestyle. In the United States, we often speak of the upper class, middle class, working class and lower class (Shepard, 1987, p. 205).

A preponderance of the literature regarding socioeconomic status relates restricted language usage of children to the models of restricted communications patterns they hear demonstrated in their homes (Bernstein, 1962; Brown, Palincsar, & Purcell, 1986) and to lack of experience in language expanding activities (Feuerstein, 1979, 1980; Ginsburg, 1972; MacDonald, Mcguire, & Havighurst, 1949).

Cabler and the Staff of the Bureau of School Service (1974) sent a questionnaire to 801 first grade teachers in Kentucky. The teachers indicated that economic conditions were judged to have a major effect upon the learning skills demonstrated by entering first graders. They found that pupils in the lower social classes have less opportunity to practice composing skills at home before they come to school because, in general, lower socioeconomic status groups tend to favor oral communication. After studying 233 kindergarten pupils from four schools, Manning, Long, and Manning (1989) indicate that this dependence on oral communication translates into a decreased level of confidence in writing ability for pupils in lower socioeconomic groups.

Gundlach, Farr, and Cook-Gumperz (1989) questioned the parity between home and school communication practices. They observed that some pupils begin to write and read before starting school and continue to employ written language and to develop writing and reading abilities in out of school settings even as they attend school. However, pupils reared by a cultural group in which oral language predominates will require different instructional techniques that bridge the gap from oral language to the predominantly written literacy practices found in school (Chall & Jacobs, 1983; Gundlach, Farr, & Cook-Gumperz, 1989).

Barnhart and Sulzby (1986) studied 32 suburban Chicago kindergarten pupils designated as either low income or high income. Over the course of three months of taped interviews, subjects were given various tasks, including the following writing assignments: (a) writing isolated words and writing words as constituents of sentences, and (b) writing a story and then reading it. One result of this study indicated pupils of different income levels did warrant different instruction. The authors also found that despite varying pace and speed of learning, all the pupils did progress toward conventional writing. Harris (1986) found similar results in a study of the literacy milestones of three enrollees from Head Start and three tuition pupils. Over a five month period, all six pupils grew in interest and knowledge of the written language as a result of their involvement with print.

In their analysis of the Writing to Read program in Hillsborough County (Florida), Haines and Turner (1987) found differences in the writing samples of kindergarten pupils based upon their socioeconomic status. According to General Impression Marking criteria, WTR pupils within the middle class had an average writing score of 2.96 while the middle class No-WTR group averaged only 1.39 (significant). In contrast, the lower class WTR pupils had an average writing score of 1.15 while the No-WTR pupils averaged .93 (not significant). Implied in the results of this data is that the Writing to Read program "may not have uniform effects for all participants" (Freyd & Lytle, 1990, p. 86).

Due to the results of the studies cited above, the effects of a specific curriculum such as Writing to Read cannot be isolated without accounting for the effect of socioeconomic status. Additionally, any study of the effects of a specific curriculum should also explore the varied responses of the different social classes.

Individual Student Learning Style

Research over the past several decades has revealed that pupils learn in many ways because they have varied personal traits, cognitive abilities, self-concepts, and life experiences (Bartelo, 1983; Gregorc, 1982; Keefe, 1988). However, before discussing these varied learning styles, it is important to note that learning is often equated with the ability to solve problems. The reason for this is axiomatic: The proof of learned knowledge is the ability to use that knowledge to help solve problems (Greene, 1986). Thus, solving a problem is an evaluative phase in which one finds out what one has learned and what one does not yet know.

Malcom, Lutz, Gerken and Hoeltke (1981a) propose that problem solving is an iterative process that ends with a correct solution to the problem at hand: First, a problem is presented; the pupil uses both intrapersonal information (derived from feelings, values, attitudes, and beliefs) and extrapersonal information (gained from other people, objects, and events) to develop a solution; if the solution is incorrect, then the problem remains, and the cycle is reiterated. They suggest that various learning styles should be defined by how much intrapersonal and extrapersonal information is used to solve problems (Malcom, Lutz, Gerken, & Hoeltke, 1981a).

The link between learning style and the composing process is a new concept of writing as a 'problem-solving' process which includes planning, organizing, structuring, and revising. Decisions about wording, grammar, punctuation, content, and semantic flow can be made based upon feelings, values, beliefs or judgments about writing, or they can be made as a result of information derived from people, objects, and events. Thus, the learning style of a pupil has an impact on how the pupil will convey his thoughts in written form (Flower & Hayes, 1980; Hull, 1989).

Dyson (1987) asserts that teachers must know their pupils' learning (work) styles in order to meet the needs of each writer. Furthermore, educators must go beyond merely knowing the learning styles and writing abilities of their pupils; educators must enhance the pupils' learning style and writing ability. A study by Barry (1985) exemplifies this philosophy. The author recorded the history of a pupil who could dictate stories but had difficulty writing independently. In order to encourage the pupil to write, the author initially transcribed the pupil's story as the pupil made it up. This allowed the pupil to see the written form of his work. The next step was to have the adult read the pupil's stories to him. This step provided the pupil with an understanding of the function of the writing process-- the accurate recording of ideas. Finally, the pupil was encouraged to write down the story he had heard, proving that he could accurately record his personal thoughts.

While Barry's study (1985) exemplified growth in writing acumen, there is also growth in learning style. Malcom, Lutz, Gerken and Hoeltke (1981a) suggest that the extensive, yet balanced, use of both intrapersonal and extrapersonal information in learning styles is most efficacious in the writing process. Yet most learning styles do not achieve this balance. During the 1985-86 school year, Dyson (1988) studied four kindergarten and four first grade pupils. Two of the pupils wrote within the context of imaginary worlds. Initially, these two pupils employed learning styles solely dependent upon internal information which resulted in the composition of narratives based upon their personally created imaginary worlds. Through extensive writing experiences within their classroom the pupils were able to balance their initial mode of learning and receive information from other people. They began to incorporate this external information into their writing The pupils were able to expand their writing from the realm of imaginary worlds to a one-sided depiction of the social climate within the classroom and, finally, to a wider view and examination of their experiences in the real world.

Emig (1977) notes that this process of mutual growth of learning style and writing acumen is natural since they occur at the same rate: "One writes best as one learns best, at one's own pace. Or to connect the two processes, writing can sponsor learning because it can match its pace [sic]" (p. 126). As Emig (1977) indicates, learning styles may, at the least, be well correlated with writing proficiency. Thus, the rationale for considering learning styles in this study is manifest. Not only is it necessary to identify which learning styles respond well to the Writing to Read program, but also research that attempts to isolate the effect of Writing to Read on writing outcomes must account for learning styles.

Attitude Toward School

Research over the past several decades has revealed an interest in the nature and effect of attitude on behavior (Severy, 1974). Two schools of thought exist: (a) The first holds that an attitude is a tendency to evaluate an object or construct in positive or negative terms; (b) the second, component theorization of thought, emphasizes the affective (feelings toward objects or people), cognitive (individual's beliefs and knowledge), and behavioral components (overt behavior exhibited toward objects or people) (Severy, 1974, p. 1). Within the context of this section of Chapter II, the researcher will promote the former definition of attitude.

Much of the literature deals with attitude toward writing and writing outcomes. In a study involving 36 randomly chosen grade one pupils from three expressive writing classrooms and three skill sequenced classrooms, Willinsky (1985) found that the expressive writing pupils only made gains in the acquisition of technical vocabulary and their positive attitude toward writing declined over the course of the year. Willinsky attributed the decline in positive attitude toward writing as a reflection of the increased writing demands placed upon the expressive writing pupils. A problem with studying attitude toward writing is that well-known measures are not available; researchers often develop their own attitude toward writing scales for this reason. Willinsky (1985) stated that his "[attitude] measure is admittedly crude"; he also asserted that "attitude measures are always a source of caution and qualification" (p. 7). However, a validated test of attitude toward school designed for primary age pupils does exist (Hogan, 1975a). It tests attitude toward language arts as well as attitude toward math, science, and social studies.

The bulk of the research on attitudes and the Writing to Read program has consisted of evaluations of teachers', parents', and pupils' attitudes toward the program itself (Deboe, Ingebo, Leonard, Moilanen, Williams, & Yagi, 1984; Educational Testing Service, 1984; Gold & McKenzie, 1988; Kirkland, 1984; Moilanen, 1986). Nevertheless, attitude toward school may have a significant effect on writing outcomes as evidenced by Willinsky's study. A national study of pupils in grades 4, 8, and 11, Applebee, Langer, and Mullis (1986) found no significant relationship between writing attitude and writing achievement in grades 4 and 8. Thus, it is imperative that attitude toward school be studied here, and that its effect, if any, be controlled when attempting to isolate the effect of the Writing to Read program on writing outcomes.

Academic Achievement

Within the Writing to Read literature pertaining to academic achievement and writing outcomes, the effect of Writing to Read on spelling and language achievement test scores was discussed extensively by a number of authors (Brierley, 1987; Educational Testing Service, 1984; Gold & McKenzie, 1988; Haines & Turner, 1987; Kirkland, 1984; Leahy & Zennie, 1988; Moilanen, 1986; Spillman, Hutchcraft, Olliff, Lutz, & Kray, 1986).

In an evaluation of the District of Columbia Public School's use of the WTR program, Gold and McKenzie (1988) studied the effects of the Writing to Read program on Metropolitan Achievement Test (MAT) reading and language achievement scores. The study involved 86 WTR kindergarten pupils, 155 No-WTR kindergarten pupils, 130 WTR first graders and 152 No-WTR first graders. The Writing to Read program did not produce a significant effect on MAT reading and language achievement scores in first graders; the average increase from pretest to posttest on the MAT was about 12.5 points for the WTR group. Gold and McKenzie suggest that this non-significance was due to the insufficient hours of instruction allotted for Writing to Read within the first grade language arts program. The study did find a significant effect on the MAT reading and language achievement scores of selected kindergarten pupils of almost 70 points from pretest to posttest for the WTR group. Many other authors have also found a significant relationship, either positive or negative, between reading and writing ability and the use of the Writing to Read program (Freyd & Lytle, 1990, p. 86)

The significant effects of Writing to Read on academic achievement provide sufficient cause for suspicion of the converse, namely that academic achievement has a significant effect on writing outcomes. Thus, it is imperative that academic achievement be accounted for when trying to isolate the effect of the Writing to Read program on writing outcomes. Additionally, the effect of Writing to Read on the writing outcomes of pupils with varying academic achievement should be examined.

Hours of Instruction

As Tway (1984) indicates, writing involves writing with an eye to alternatives in content, form, structure, voice, and language. This analysis and personal struggle with words takes time:

> Not every decision can be a snap decision, carrying writing right along without interruption. It takes an understanding teacher, one who understands children and writing, to be tolerant of a student who lets her mind 'go blank' in the middle of the language arts class. Nothing will appear to be happening... Time to think is essential to the education of a thinking person. (Tway, 1984, p. 16)

In order to be able to do their best pupils need the time to finish writing experiences. Birnbaum (1982) tells of a fourth grader who had to write a story in a given time period and who commented on the story she wrote 'This isn't my story. I would have done it differently if I had enough time' (p. 256). Not only do pupils need to have the time to finish stories as they wish, but pupils also need the time to use words and writing styles to convey meaning:

> To discover meaning, entertainment, or power in writing, students must feel a personal involvement in what they are doing. Time for composing, then also includes time for composing the self, time for putting the writer inside the writing (Tway, 1984, p. 18).

In a study of selected fourth- and seventh-grade students, Birnbaum (1982) reported that the more proficient pupils paused longer to deliberate over topics, related ideas, and possible organizations to represent their meaning to an audience. Birnbaum found that while the more proficient pupils were writing their activities and their patterns of pauses indicated that they continually monitored their evolving texts and evaluated their choices in view of their purposes. Birnbaum reports, however, that the less proficient pupils seemed to be stringing discrete ideas and words together with little regard for overall meaning or the anticipated needs of the reader. Their thinking tended to be additive rather than evaluative.

Hall (1986) observed two six-year-old kindergartners from different classrooms who were able to write books because their kindergarten instructors recognized their enthusiasm and provided them with extra time. One pupil was frustrated because she was unable to finish rewriting a story about Cinderella during the limited classroom writing time. With the encouragement of her teacher, she was allowed to finish the story over a three week period. The second pupil wrote at home and during lunch and recess breaks at school creating a collection of 10 one-page stories in two weeks. The results indicated that because more time was set aside for them to work on their projects, they became more involved in writing, and they received reinforcement from their family members.

Dobson (1985) discussed the writing of five pupils from an inner city in Vancouver, British Columbia, who had little interest in the writing process. Over the course of five months the pupils who initially had only a working knowledge of "how to use the alphabet letters to represent words or sounds within words" (Dobson, 1985, p.31) were writing stories of "greater interest and complexity than their faster learning classmates" (p. 36). The author attributed this to the fact that the pupils wrote one half hour every day. "A program that includes daily spontaneous writing lets the children work at their level of understanding. By writing they view themselves as writers" (p. 36).

In a study of 110 WTR and 130 No-WTR kindergarten pupils and 193 WTR and 133 No-WTR first grade pupils, Spillman, Hutchcraft, Olliff, Lutz, and Kray (1986) found that all of the WTR kindergarten pupils had the opportunity to dictate, write, or do both activities with 90% doing these activities twice a week. Of the No-WTR pupils, 62%

had never had those experiences. The WTR pupils had more varied writing experiences because Writing to Read guaranteed the inclusion of those components in the language arts curriculum. However, in their evaluation of the District of Columbia Public Schools Writing to Read program, Gold and McKenzie (1988) suggested that their non-significant results were due to insufficient hours of instruction allotted for Writing to Read within the first grade language arts program. Furthermore, Haines and Turner (1987) suggested that the significant results they found were due to the fact that WTR pupils spent more time writing than in the years before they had WTR.

Tway (1984) draws the conclusion that "time for rich experiences, time for discussing what these experiences mean to children, time to relate these experiences to previous ones, and time to write about them are musts for a viable writing program" (Tway, 1984, p. 15). Thus, given the research and theory cited, it is imperative that relevant variables related to hours of instruction be accounted for when using writing outcomes as a dependent variable.

Summary

The Writing to Read program employs the computer and word processor to assist in writing instruction. Through activities found at five stations pupils are oriented to the daily practice of phoneme identification in specific cycle words. The practice of sounds and letters at the computer station, the work journal station, the make words station, and the listening library station culminates in writing at the writing/typing station.

As outlined in this chapter, there has been an interest in the way the Writing to Read program engages pupils in the writing process. However, due to inherent research design problems cited in many of the studies, there is inconclusive evidence to support the contention that the Writing to Read program does indeed foster improved writing ability in kindergarten and first grade pupils (Freyd & Lytle, 1990). Of particular concern and interest to the researcher were the methods employed to select the subjects in the studies, the use of open-ended topics as a means of encouraging pupils to write, the effective use of General Impression Marking to evaluate the writing samples, and the effects of Writing to Read on writing outcomes within the categories of gender, race, socioeconomic status, individual student learning style, attitude toward school, and academic achievement.

The literature cited in this chapter specifically noted the high standards of inter-rater and intra-rater reliability of General Impression Marking, and its validity when evaluating large numbers of writing samples from pupils with varying backgrounds. An examination of the literature regarding gender indicates that first grade girls write longer, more structurally organized stories which feature more examples to support their thinking than do first grade boys. However, in one study kindergarten boys scored higher on the six point General Impression Marking scale than did the kindergarten girls. The literature regarding racial differences in writing performance suggests that a cultural inclination toward oral communication may effect written communication, however, confidence in the writing process is more likely to be attributed to social class differences. The literature regarding socioeconomic status also asserts that the pace of acquisition of conventional composing skills is influenced by social class. One study indicated that those pupils from a lower social class did not benefit significantly from the Writing to Read program but that the pupils did significantly improve their composing skills. An examination of literature regarding individual student learning style indicated that pupils utilize various personal problem-solving techniques in the writing process and that these techniques influence the quality and clarity of the written product.

Factors which impinge upon writing proficiency and relate to the school experience include pupils' conception of school, academic achievement, and the amount of time dedicated to language arts and writing. Research relating to attitude toward school and its effect on writing outcomes was not found by the researcher. Yet, the literature cited regarded pupil attitudes as very influential in effecting writing outcomes. In addition, the literature indicated that a writer's commitment, devotion, and attitude toward the written product is enhanced when regular classroom time is designated as time for writing. Likewise, the possibility that academic achievement may have an effect on writing outcomes is made distinctly plausible by the amount of research devoted to testing the effect of the Writing to Read program on bolstering academic achievement. Finally, research regarding hours of language arts and writing instruction indicated that proficiency in writing requires "patterns of pauses" and moments of reflection whereby the writer overviews the product and considers the impact and general clarity of the words on the paper.

Among the topics discussed in Chapter III is the research methodology used to account for these variables which may effect writing outcomes in order to isolate the effect of Writing to Read on writing outcomes. Chapter III will also discuss in detail the research instrumentation used to measure these outside influences, the experimental (WTR) and control (No-WTR) treatments, and the research designs used to help identify the types of pupils on whose writing proficiency the Writing to Read program seems to have a significant effect.

CHAPTER III

RESEARCH METHODOLOGY

Introduction

The purpose of the study was to examine the writing outcomes of first grade pupils who had participated in different programs designed to encourage composing skills. The particular focus of this study was to examine the effects of the Writing to Read (WTR) program on writing outcomes of first grade pupils, and to determine whether these effects varied according to gender, race, socioeconomic status, individual student learning style, attitude toward school, academic achievement, hours of language arts instruction per week, or hours of writing instruction per week.

Subjects

The sample for this study was drawn from the first grade populations of two rural, public elementary schools in a southern Mississippi county. The first graders at one school experienced the Writing to Read program during 17 1/2 school weeks. During this time, the first grade pupils at the No-WTR school experienced the traditional language arts curriculum in lieu of the Writing to Read program.

The WTR school had a total school population of 726 pupils, which included 69 pupils who were involved in this study out of the 118 total first graders in five classes.

The No-WTR school had a total school population of 585 pupils, including 80 pupils who were involved in this study out of the 100 total first graders in four classes.

The basic demographic data on the nine first grade classes in this study are contained in Tables 1 through 4. Tables 1 and 2 list WTR and No-WTR first grade class profiles for the entire first grade populations. Tables 3 and 4 provide similar class profiles for the WTR and No-WTR groups, respectively, once the subjects who could not be used were removed. In order to be included in this study, a pupil must (a) have taken the Stanford Early School Achievement Test, Level 1, (SESAT) on April 17, 1989, while in kindergarten, (b) have obtained parent or guardian consent, and (c) have been present to complete the Survey of School Attitudes and a writing sample. Of the 118 first grade WTR pupils, 69 were included in this study, 33 were rejected due to the SESAT constraint cited above, 10 did not receive parent or guardian consent, and 6 were absent. Of the 100 first grade No-WTR pupils, 80 were accepted, 8 were rejected due to the SESAT constraint, 9 did not receive parent or guardian consent, and 3 were absent.

Table 1 shows that the total WTR first grade population was composed of 48% males, 10% black pupils, and 44% high socioeconomic status (SES) pupils. Table 2 shows that the No-WTR school's total first-grade population was composed of 42% males, 19% black pupils, and 50% high SES pupils. Table 3 shows that the experimental (WTR) group in this study was

Table 1

Basic Classroom Demographics for the Entire WTR School First Grade Population

	Gender		Race			Socioeconomic Status		
Class	Male	Female	Black	White	Other	Free	Reduced	Pay
1	11	9	4	16	0	17	2	1
2	12	12	3	21	0	10	0	14
3	11	12	2	21	0	14	0	9
4	13	13	2	24	0	9	2	15
5	10	15	1	24	0	11	1	13

Table 2

Basic Classroom Demographics for the Entire No-WTR School First Grade Population

	Gender		Race			Socioeconomic Status		
Class	Male	Female	Black	White	Other	Free	Reduced	Pay
1	12	13	4	21	0	10	2	13
2	11	14	6	19	0	12	3	10
3	10	15	4	21	0	8	2	15
4	9	16	5	20	0	11	2	12

Table 3

Basic Classroom Demographics Using Only the WTR Pupils Who Participated in This Study

	Gender		Race			Socioeconomic Status		
Class	Male	Female	Black	White	Other	Free	Reduced	Pay
1	5	4	1	8	0	6	1	2
2	6	7	1	12	0	4	0	9
3	7	8	2	13	0	7	0	8
4	7	8	1	14	0	5	0	10
5	6	11	1	16	0	10	0	7

Table 4

Basic Classroom Demographics Using Only the No-WTR Pupils Who Participated in This Study

	Gender		Race			Socioeconomic Status		
Class	Male	Female	Black	White	Other	Free	Reduced	Pay
1	7	12	2	17	0	5	3	11
2	9	11	7	13	0	12	1	7
3	10	5	4	11	0	10	0	5
4	6	20	1	25	0	5	1	20

found to be composed of 45% males, 9% black pupils, and 52% high SES pupils. Table 4 shows that the control (No-WTR) group in this study contained 40% males, 18% black pupils, and 54% high SES pupils. Thus, it was concluded that the WTR and No-WTR schools were well matched on the basis of gender, racial affiliation, and socioeconomic status.

Group Treatment

The Mississippi State Department of Education stipulates that first grade pupils must receive at least three hours per day of language arts instruction. Of this time, two and one-half hours is designated as reading instruction time, while the remaining 30 minutes can be allotted to other language arts instruction. According to the Mississippi Curriculum Structure (1986), the goal of the language arts curriculum is

> to help students [pupils] develop effective and appropriate communication skills through the use of integrated listening, speaking, reading, and writing activities. Realization of this goal will be reflected in students' [pupils'] competent use of receptive language skills (listening and reading) and expressive language skills (speaking and writing) (p. LA-1).

Both the experimental (WTR) group and control (No-WTR) group complied as closely as possible to this general language arts requirement.

Experimental Group

The experimental (WTR) group consisted of 69 first grade pupils in a rural public school in a southern

Mississippi county. All of these pupils received the Writing to Read program from October 2, 1989, to February 16, 1990. The five teachers and 69 pupils followed the guidelines established by John Henry Martin in conjunction with International Business Machines Corporation (IBM). Each classroom went to the computer lab for approximately one hour a day five times a week. During this hour-long session children were able to work individually, in pairs, or in groups of four or five at one of the five stations. The pupils moved from station to station depending on availability of the equipment and their own progress and practice with the phonemes.

Thus, the WTR pupils received two hours of reading instruction and one hour of Writing to Read. In practice, the WTR teachers implemented the reading instruction using varied teaching materials and methods including reading textbooks, fill-in-the-blank workbooks, teacher resources, and chalkboard exercises. Additionally, one of the WTR teachers also employed learning centers to provide the mandated and varied curricular experiences to her pupils.

Control Group

The control (No-WTR) group consisted of 80 first grade pupils from a different rural school in the same public school district within a southern Mississippi county. The reading instruction time was administered to the pupils each day from 8-10:30 a.m. by a reading teacher, and the remaining school curriculum, including the other half hour of language arts instruction, was administered by the homeroom teacher. The same four teachers were responsible for all first grade instruction; each pupil had one of these teachers for reading and another teacher for homeroom. The language arts curriculum was implemented using textbooks, fill-in-the-blank workbooks, teacher resources, and chalk board exercises.

Data Collection

The superintendent and two principals from one selected southern Mississippi county were contacted in December of 1989 for the purpose of describing the study and receiving permission to carry out the investigation. Permission was granted on December 27, 1989, from the superintendent of the school district; the letter of acceptance is included in Appendix A. In order to insure that the pupils in the study were presented with a beneficial treatment rather than a physiologically, psychologically, and sociologically harmful treatment, the University of Southern Mississippi Human Subjects Protection Review Committee reviewed and evaluated the research proposal. On February 19, 1990, permission to carry out the study was granted by the Human Subjects Protection Review Committee. This permission form is also included in Appendix A. The principals then determined the days they would allocate for the two hours of testing. A letter was sent out to the parents of all the first grade pupils in the WTR and No-WTR schools on March 26, 1990, requesting their agreement to allow the researcher to: (a) gather demographic data from the school records, (b) have their child write one story, (c) have their child complete a survey of their attitude toward school, and (d) give permission for the teachers to identify through observation their child's learning style. The covering letter and signature page of the parental or guardian consent form are included in Appendix A of this document.

The following data were collected:

1. One free-writing sample, based on an open-ended story starter, was collected on the April 4-5, 1990, by a group of trained testers. The writing samples were then scored from June 9-19, 1990, by a panel of "blind" reviewers adhering to the pre-established guidelines of General Impression Marking (Educational Testing Service, 1984). The guidelines for collection of writing samples and the first grade writing sample marking criteria are included in Appendix B.

2. The Survey of School Attitudes (SSA) (Hogan, 1975b) was administered by the team of trained testers on the April 4-5, 1990, and scored thereafter by the researcher.

3. The Learning Style Identification Scale (LSIS) (Malcom, Lutz, Gerken, & Hoeltke, 1981b) was completed for each pupil during May 17-28, 1990, by the classroom teachers and scored by the researcher.

4. The scores on the Stanford Early School Achievement Test, Level 1, (Madden, Gardner, & Collins, 1982b) were obtained by the researcher from school records. On May 22, 1990, the No-WTR group's scores were obtained, and the WTR group's scores were obtained on May 25, 1990.

5. Data on gender, race, and lunch program enrollment were obtained by the researcher from school records. On May 22, 1990, data on the No-WTR pupil were collected, and data on the WTR pupils were collected on May 25, 1990.

The administration of the SSA was divided into two 20-minute sessions, separated by the 30-minute writing experience. Two 10-minute breaks occurred between the SSA sessions and the writing session. In order to further facilitate the collection process for the writing samples and the Survey of School Attitudes (Hogan, 1975b), a procedure similar to the one proposed by Naron and Elliot (1987) was employed. Nine undergraduate education and psychology majors were given a 60-minute training session on how to proctor the testing sessions scheduled for April 4-5, 1990. Each tester read the SSA questions to the pupils in a classroom, collected the SSA test booklets from the pupils in the class, was present while the teacher provided the story starter to ensure "that the teachers in fact [would] not assist their pupils in the writing task" (Naron & Elliot, 1987, p. 11), and collected the writing samples.

In a letter dated March 26, 1990, the teachers and teaching assistants were thanked for their support of this study. They were also asked by the researcher not to assist their pupils with spelling words, writing stories, or completing the Survey of School Attitudes. This letter is included in Appendix A.

Instrumentation

Writing Samples

In order to complete the writing sample, the pupils were given standard first grade writing paper and a number 2 pencil. The directions in Appendix B were read to the pupils, and the following story stem was written on the board by the teacher:

One day I found a magic hat...

The pupils were given an opportunity to ask any questions regarding the writing assignment. At the completion of the 30 minute writing session, the pupils were asked to stop writing, and the papers were collected by the trained testers.

General Impression Marking

The writing samples were evaluated by a panel of "blind" reviewers located in Trenton, New Jersey. The reviewers were trained by Educational Testing Service in the process of General Impression Marking and, for the purpose of this study, employed the General Impression Marking First Grade Criteria (Fowles, 1984) in Appendix B. Using General Impression Marking, writing samples are scored according to the following skill-specific rubric: clarity and fluency, organization, mechanics, and content (Fowles, 1984). Under the category of clarity and fluency, the reviewers identified the extent to which ideas were well developed and clearly expressed. Under the category of organization, the reviewers identified the extent to which the paper had a logical flow from the story starter. In the third category, mechanics of writing, the reviewers identified variation in structure and phrasing used by the pupil. Finally, the fourth category, content, was examined. The reviewers identified whether an interesting plot existed (e.g. conflict and resolution or a surprise ending) or exceptional control of language (e.g. lively dialogue or vivid descriptions). Based on these areas, each writing sample was assigned a holistic score from 1 (low) to 6 (high).

On May 24, 1990, the writing samples were sent to the panel of reviewers. A letter sent with the writing samples stated the guidelines to be used in the assessment of the writing samples. This letter is included in Appendix A. According to the guidelines presented in Fowles (1984), the reviewers in this study were instructed to quickly read the unmarked writing samples in order to understand what had been written. They performed this task on June 9, 1990. On June 12, 1990, they read the compositions once again in order to assign a mark to the writing samples. In this way the reviewers were given the opportunity to read all of the writing samples twice before assigning a writing score. Each mark was to be put on the writing sample and then covered up so that the reviewers would not be influenced by previous scores. On June 19, 1990, discrepancies of one point were re-evaluated. While no discrepancies of more than one point occurred in the evaluation process, arrangements had been made for an arbitrator to evaluate the writing sample and assign a definitive mark. On June 19, 1990, the reviewers also re-read all of the writing samples to fulfill the requirements of intra-scorer reliability.

In terms of reliability, Hogan and Mishler (1982) define inter-scorer reliability as "the consistency with which different raters score or judge a given set of papers" (p. 10), and intra-scorer reliability as "the consistency with which one rater scores or judges a given set of papers on different occasions or under varying conditions" (p. 10). Cooper and Odell (1977) dispel doubts about General Impression Marking by indicating that many studies have achieved an inter-scorer reliability of 0.80 or above. Using Fowles' (1984) guidelines for employing holistic scoring ensured that the evaluation results were consistent among reviewers and in various situations. Within this study, inter-scorer reliability was 0.94 and intra-scorer reliability was 0.98.

Learning Style Identification Scale

The Learning Style Identification Scale (LSIS) (Malcom, Lutz, Gerken, & Hoeltke, 1981b) consists of 24 items. The observer rates the pupil on a scale of one (low) to five (high) for each behavior item. The evaluation of a class of 25 pupils requires approximately 40-60 minutes. From May 17-28, 1990, the individual WTR classroom teachers were given the opportunity to identify the learning styles of the pupils in their homerooms while the No-WTR reading teachers identified the learning styles of their pupils.

The five most common learning styles are based on the preferred manner in which a pupil reacts to situations and solves problems; that is, to what extent the pupil relies on internal sources of information such as feelings, beliefs, and attitudes, and on external sources of information, such as people, events, and social institutions to help solve problems. In essence, higher self-concept results in higher use of intrapersonal information, and higher cognitive development corresponds to higher use of extrapersonal information. Learning Style I pupils have a high self-concept, but their cognitive development is low. Learning Style II pupils are deficient in both cognitive development and self-concept. Learning Style III pupils have high cognitive development, but a low self-concept. Learning Style IV pupils show advanced cognitive development and high self-concept. Learning Style V pupils have an average self-concept and show adequate cognitive development; these pupils are characterized by average scholastic scores. Thus, they are not deficient in self-concept or cognitive development, as are Learning Styles I-III pupils, but neither do they function at as high a level as Learning Style IV pupils.

The 24 items on the LSIS specifically deal with Learning Styles I-IV. The 24 ratings are assigned in section 1 of the Rating, Scoring, and Profiling Form, and a raw score for Learning Styles I-IV is computed in section 2 based on those ratings. Each of the four raw scores is then converted to a standard score employing a conversion table supplied by the authors. A pupil's learning style is then determined using the following criteria: "A predominant learning style of a student will be shown on the profile as at least one-half standard deviation above the mean (X = 50, SD = 10) and at least three points above the standard score for any other learning style" (p. 8). The default learning style, Learning Style V, is assigned if no score is above 55. Finally, if two or more scores are above 55 and within 2 points, then the pupil is considered to have a combined learning style, which incorporates some or all of the characteristics of the constituent styles (Malcom, Lutz, Gerken, & Hoeltke, 1981a).

In a study of 98 second and fifth grade pupils, the authors estimated the reliability of the Learning Styles Identification Scale

> through internal consistency and test-retest procedures... Using the Kuder Richardson Formula 20 (KR 20) procedure, coefficients ranged from .77 to .91... Using the split-half procedures with correction by the Spearman-Brown Prophecy Formula, coefficients ranged from .75 to .89... (Malcom, Lutz, Gerken, & Hoeltke, 1981a, p. 44).

In terms of stability, the "results of the two ratings were correlated and the obtained coefficients ranged from .84 to .96" (Malcom et al., 1981a, p. 44). Factor analysis on the item-total correlation coefficients was r=.20. Factor analysis verified that items in the Learning Styles I, II, and III were positively correlated while items in Learning Style IV were negatively correlated with the other styles.

Survey of School Attitudes

The Survey of School Attitudes (Hogan, 1975b) is a 60-item assessment tool designed to measure the reactions of first grade pupils to reading and language arts, mathematics, science, and social studies. The pupils examine an ideogram related to one of those curriculum areas while the test proctor reads an associated script. The pupil then indicates like, dislike or disinterest in the subject by marking a happy, sad or grimacing face, respectively. The recommended administration time is two 20-minute group sessions.

In terms of validity, Hogan (1975a) indicates that the Survey of School Attitudes is only valid if the measure is used to evaluate affective reactions to the aforementioned school curricula (p. 12). Analysis of test/re-test reliability was performed employing one school with ten days between test administration times. A correlational split-half test showed statistical reliability to be between 0.80 and 0.90 (Hogan, 1975a).

Stanford Early School Achievement Test, Level 1

The Stanford Early School Achievement Test, Level 1, (SESAT) (Madden, Gardner, & Collins, 1982a) results were obtained during May 28-29, 1990. The SESAT requires nine 20-25 minute sessions; it is comprised of five distinct subtests: (a) sounds and letters, (b) word reading, (c) listening to words and stories, (d) mathematics, and (e) environment. The sounds and letters subtest has two major sections: auditory perception and symbol perception. The auditory perception section asks the pupil to match beginning and ending sounds in words. The symbol perception section asks the pupil to recognize upper-case and lower-case letters and to match letters to the sounds those letters frequently represent. The word reading subtest involves words that are part of the pupils' speaking and listening vocabularies. Pupils are asked to match two words together in print, match a spoken word to a written word and identify words that name illustrations. Listening to words and stories is a subtest which is designed to measure a pupil's school vocabulary and every day living vocabulary. The mathematics subtest evaluates the pupil's knowledge of basic number concepts, geometric shapes, and addition and subtraction facts. The environment subtest evaluates the pupil's "understanding of the basic concepts reflecting the social and natural environment of their world" (Madden, Gardner, & Collins, 1982a, p. 6).

Davison (1985) identifies the total norm group for the SESAT as being 465,000 pupils from major "U.S. geographical regions, public and private school systems of varying sizes" (p. 1449). Subkoviak and Farley (1985) observe that

> of the 280 Kuder-Richardson coefficients reported, 68% were above .90, and 97% were above .80. Of the 89 alternate forms coefficients reported, 16% were above .90, and 81% were above .80. Thus, the composite scores and various subtest scores are generally satisfactory in terms of reliability. In summary, the authors say that the SESAT continues a long tradition of excellence (pp. 1451-1452).

From the evidence cited, General Impression Marking (Educational Testing Service, 1984), the Learning Styles

Identification Scale (Malcom, Lutz, Gerken, & Hoeltke, 1981b), and the Survey of School Attitudes (Hogan, 1975a) are clearly valid and reliable.

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Analysis of Data

Necessary calculations were performed on the Honeywell DPS-90 computer using the SPSS-X V2.1 regression package at the University of Southern Mississippi in Hattiesburg, Mississippi. All hypotheses were tested using multiple linear regression, and significance was established at the 0.05 level.

Before discussing how the research hypotheses were tested, some prefacing statements about the research design are needed. First, the category 'other' was omitted from the variable race because all pupils in the study were either black or white. The variable of socioeconomic status was also reduced to two categories, low and high. The pupils on the free and reduced lunch payment plans were combined into the low socioeconomic status category since there were only 6 pupils on reduced lunch. The high socioeconomic status category contains only those pupils on the full lunch payment plan. Additionally, since there were only seven pupils with Learning Style V (adequate cognitive development and average self-concept), this category was omitted; each pupil was assigned the learning style in which the highest standard score occurred-- in all seven cases, Learning Style IV was assigned.

These omissions were performed due to the difficulty of statistical analysis caused by inadequate first grade pupil representation within the categories omitted. However, this last modification of learning styles may seem troublesome at first since Learning Style V pupils often "constitute the largest group among the different specific learning style groups" (Malcom, Lutz, Gerken, & Hoeltke, 1981a, p. 37). However, the following additional information must be considered before judging the propriety of omitting Learning Style V. First, "Style V students tend to have average scores in scholastic achievement" (p. 37), yet "students who use Learning Style V can be described as similar to Style IV students. The degrees are different, however" (p. 5). The cognitive development and self-concept of the Style V learner are not deficient, but are also not as high as the Style IV learner, who shows very high scholastic ability (Malcom et al., 1981a). In this study, there was an unusually small number of Learning Style V pupils; usually, "approximately one-third of the students rated are classified as Style V learners" (p. 49), but less than five percent showed that tendency in this study. Thus, given the small number of Learning Style V pupils, and the congruence of Style IV and Style V characteristics, the inclusion of the seven pupils into the Learning Style IV category seemed most efficacious.

The Survey of School Attitudes (Hogan, 1975a, 1975b) measures a pupil's attitude in four subject areas: attitude toward reading and language arts, attitude toward mathematics, attitude toward science, and attitude toward social studies (Hogan, 1975b). Thus, each pupil received a raw score from 0 to 30 in each of the four attitude subject areas. Then, within each subject, each pupil was classified as having either low or high attitude based on whether the pupil scored below or above the mean raw score of this study's population.

Severy (1974) supports this generalization, indicating that attitudes may be used as dependent and independent variables where low scores and high scores are examined. Table 5 indicates the attitude raw scores that correspond to the low and high categories for each attitude subject area. As shown in Table 5, a raw score of 25 or greater indicates that a pupil is in the high attitude category; the exception is the measure of attitude toward mathematics, in which a 24 or greater qualifies a pupil for inclusion in the high attitude category. Thus, within each of the four attitude subject areas, all pupils with raw scores below the raw score threshold for a particular subject area were assigned to the low attitude category for that subject area.

Similar generalizations were made for academic achievement as those made for attitude toward school. First, academic achievement was measured by the Stanford Early School Achievement Test, Level 1, (SESAT), which

Table 5

Survey of School Attitudes Raw Score Thresholds for Division of Attitudes into Low and High Categories

Attitude Measure	Low	High
Reading and Language Arts	0-24	25-30
Mathematics	0-23	24-30
Science	0-24	25-30
Social Studies	0-24	25-30

Table 6

Stanford Early School Achievement Test, Level 1, National Percentile Thresholds for Division of Academic Achievement into Low and High Categories

SESAT Subtest	Low	High
Sounds and Letters	1-59	60-99
Word Reading	1-64	65-99
Listening	1-48	49-99
Mathematics	1-51	52-99
Environment (Science)	1-58	59-99

contains five subtests: sounds and letters, word reading, listening to words and stories, mathematics, and environment. Furthermore, as with attitude scores, general statements about pupils with varying academic achievement could not be made without dividing the total sample into achievement levels. Therefore, the mean of this study's population for each subtest area was used as the delimiter between the low and high achievement categories. Table 6 shows the Stanford Early School Achievement Test, Level 1, (Madden, Gardner, & Collins, 1982b) national percentile scores which qualify a pupil for inclusion in either the low or high achievement categories for the indicated subtest. As Table 6 shows, the minimum percentile required to be in the high academic category is 60% on the sounds and letters subtest, 65% on word reading, 49% on listening to words and stories, 52% on mathematics, and 59% on environment.

As an additional note regarding academic achievement, the rejection of pupils who did not complete the SESAT, Level 1, on April 17, 1989, while in kindergarten was necessary in order to insure that the SESAT percentile scores were derived using the same national normal curve. This provision, in turn, helped to insure consistency of academic achievement ratings among all pupils included in this study. However, this SESAT delimitation had virtually no effect on the mean writing scores of the WTR and No-WTR groups. The average writing score of the 33 WTR pupils who were excluded from this study was 2.91; the WTR group's mean writing score was 2.84 without those pupils and would have been 2.86 if they were included. Likewise, the 8 No-WTR pupils who were excluded from this study had a mean writing score of 2.63; the No-WTR group's mean writing score was 2.56 and would have been 2.57 if they were included. This information supports the contention that the WTR and No-WTR sample populations used in this study very accurately represented the total WTR and No-WTR first grade school populations.

Finally, with regard to instruction time, 'hours of instruction' is the common terminology, but this variable was measured in minutes in order to facilitate statistical analysis. However, this does not cause a problem since use of minutes in lieu of hours does not effect the amount of time measured.

Hypothesis 1 tested the effect of Writing to Read group membership on writing outcomes, removing the effects of all other variables. In Hypothesis 2, the sample was divided into males and females, then the effect of Writing to Read on writing outcomes was measured in each of the two gender categories. Likewise in hypotheses three and four, the total sample was split into categories-- by race for Hypothesis 3 and socioeconomic status in Hypothesis 4. The effect of Writing to Read on writing outcomes was then measured for each category. In Hypothesis 5, the total sample was divided into four learning style categories, and the effect of the

Writing to Read program was tested within each learning style category, as in Hypotheses 2 through 4 above.

In Hypothesis 6, the evaluation of attitude toward school was a little more complex, though the same general strategy as above was used. First, testing the effect of Writing to Read on writing outcomes according to attitude required four subhypotheses-- one for each attitude subject area. Then, within each subhypothesis, the total sample was divided into low and high attitude categories, as described above, and the effect of Writing to Read on writing outcomes was tested in each of the eight attitude categories.

Examination of academic achievement in Hypothesis 7 required methods similar to those used for Hypothesis 6. As with attitude scores, subhypotheses were required in order to test the effect of Writing to Read on writing outcomes according to academic achievement. Five subhypotheses were required-- one for each SESAT Level 1 subtest. Within each subhypothesis, the total sample was divided into low and high achievement categories, and the effect of Writing to Read on writing outcomes was tested in each of the ten achievement categories.

Finally, in Hypotheses 8 and 9, the total sample was divided into a WTR group and an No-WTR group, then the relationship between instruction time and writing outcomes was measured within each group. In Hypothesis 8, language arts instruction time was tested; in Hypothesis 9, writing instruction time was tested.

CHAPTER IV

ANALYSIS OF DATA

Introduction

The intent of this study was to determine whether pupil participation in the Writing to Read program would produce significant differences in writing outcomes when compared to the writing outcomes of No-WTR pupils. In order to study the effects of the Writing to Read program on writing outcomes the following variables were considered in the study: gender, race, socioeconomic status, individual student learning style, attitude toward school, academic achievement, hours of language arts instruction per week, and hours of writing instruction per week. Multiple linear regression was used to measure the significance of the differences and of the correlations.

This chapter presents the findings supported by the analysis of data collected. The first section is composed of descriptive information; it presents sample sizes and identifies the means and standard deviations of writing scores within the categories of the variables. The second section provides the results of testing the research hypotheses on the sample population of this study. Finally, a brief summarization of the findings is presented at the end of this chapter.

Descriptive Data

Table 7 shows the WTR and No-WTR sample sizes as well as the means and standard deviations of the writing scores within this study's total sample and within each category of the variables gender, race, socioeconomic status, and individual student learning style. The standard deviations were fairly consistent across all categories listed in Table 7. In addition, the WTR group had a higher mean writing score than the No-WTR group in all categories of the variables listed in Table 7 except the Learning Style III (high cognitive development and low self-concept) category.

Within the WTR group, Table 7 shows that the highest and second highest mean writing scores occurred among the Learning Style IV pupils (high cognitive development and high self-concept) and the pupils in the high socioeconomic status category, respectively. The lowest mean writing score occurred among the Learning Style III pupils; the Learning Style I (low cognitive development and high self-concept) pupils and the black pupils tied for second lowest mean writing score. Within the No-WTR group, the highest and second highest mean writing scores occurred among the Learning Style IV pupils and the females, respectively. The male category and the black category tied for lowest mean writing score, with the Learning Style II category (low cognitive and low self-concept) having the second lowest mean writing score.

Table 7

Sample Sizes, Means of the Writing Outcomes, and Standard Deviations of the Writing Outcomes Within the Total Sample and Within Each Category of the Variables Gender, Race, Socioeconomic Status (SES), and Individual Student Learning Style

	Experimental (WTR)			Control (No-WTR)		
Variable	N	Mean	SD	N	Mean	SD
Total	69	2.84	1.17	80	2.56	1.21
Gender						
Male	31	2.65	1.18	32	2.00	1.02
Female	38	3.00	1.16	48	2.94	1.19
Race						
Black	6	2.50	0.84	14	2.00	1.04
White	63	2.87	1.20	66	2.68	1.22
SES						
Low	33	2.58	1.32	37	2.32	1.20
High	36	3.08	0.97	43	2.77	1.19
Learning Style						
LS I	20	2.50	1.19	11	2.36	1.03
LS II	9	2.67	1.32	21	2.19	1.08
LS III	8	2.25	1.28	29	2.55	1.12
LS IV	32	3.25	0.98	19	3.11	1.45

Within the gender categories, the females had a higher mean writing score than did the males, though the No-WTR differential is much greater than the WTR differential between females and males. Within the racial categories, the white pupils had a higher mean writing score than did the black pupils; once again, the differential was much higher in the No-WTR group. The high socioeconomic status pupils had a higher mean writing score than did the low socioeconomic status pupils, though in this case, the WTR differential was slightly larger than the difference found in the No-WTR group. Finally, within the individual student learning style categories, Learning Style IV pupils (high cognitive development and high self-concept) scored the highest; the lowest mean occurred in the No-WTR Learning Style II (low cognitive development and low self-concept) category and in the WTR Learning Style III category (high cognitive development and low self-concept). Finally, the differential between the high and low means among the learning style categories was slightly larger in the WTR group.

Table 8 shows the WTR and No-WTR sample sizes as well as the means and standard deviations of the writing scores of the low and high categories within each of the four attitude toward school subject areas. The standard deviations were fairly consistent across all of the four low and four high attitude categories. Additionally, within each of the eight attitude categories, the WTR pupils had a higher mean writing score than the No-WTR pupils, but the average differential was less than 0.28.

Within the WTR group, Table 8 shows that the highest and second highest mean writing scores occurred among the pupils with high attitude toward science and high attitude toward reading and language arts, respectively. The lowest and second lowest mean writing scores occurred among the pupils with low attitude toward science and low attitude toward reading and language arts, respectively. Within the No-WTR group, the highest and second highest mean writing scores occurred among the pupils with high attitude toward social studies and high attitude toward reading and language arts, respectively. The lowest and second lowest mean writing scores occurred among the pupils with low attitude toward social studies and low attitude toward reading and language arts, respectively.

Table 8 also shows that within the reading and language arts, science, and social studies attitude subject areas, the high attitude categories had higher mean writing scores than their respective low attitude categories. The differentials between the low and high categories ranged from 0.26 to 0.55. However, in the mathematics subject area, the No-WTR high attitude pupils had a higher mean writing score than the low attitude pupils by only 0.01. This difference in the mathematics subject area is further substantiated among the WTR pupils-- the high mathematics

Table 8

Sample Sizes, Means of the Writing Outcomes, and Standard Deviations of the Writing Outcomes Within the Low and High Categories of the Four SSA Subject Areas

	Experimental (WTR)			Control (No-WTR)		
Subject Area	N	Mean	SD	N	Mean	SD
Reading and LA						
Low Category	23	2.57	1.20	37	2.38	1.11
High Category	46	2.98	1.14	43	2.72	1.28
Mathematics						
Low Category	29	2.93	1.22	36	2.56	1.21
High Category	40	2.78	1.14	44	2.57	1.23
Science						
Low Category	30	2.53	1.20	30	2.40	1.13
High Category	39	3.08	1.11	50	2.66	1.26
Social Studies						
Low Category	27	2.67	1.21	30	2.23	1.01
High Category	42	2.95	1.15	50	2.76	1.29

attitude pupils had a lower mean writing score than did the low mathematics attitude pupils.

Table 9 shows the WTR and No-WTR sample sizes as well as the means and standard deviations of the writing scores of the low and high achievement categories within each of the five SESAT, Level 1, subtests. The standard deviations were fairly consistent across all of the five low and five high achievement categories. Since this trend was also noted in Tables 7 and 8, the conclusion can be drawn that standard deviations of all categories in this study were fairly consistent. Additionally, within each of the ten achievement categories, the WTR pupils had a higher mean writing score than the No-WTR pupils except in the low mathematics achievement category. Not counting the low mathematics achievement category, the average differential was only 0.15 in favor of the WTR group.

Within the WTR group, Table 9 shows that the highest and second highest mean writing scores occurred among the pupils with high word reading achievement and high mathematics achievement, respectively. The lowest and second lowest mean writing scores occurred among the pupils with low mathematics achievement and low word reading achievement, respectively. Within the No-WTR group, the highest and second highest mean writing scores occurred among the pupils with high listening to words and stories achievement and high mathematics achievement, respectively. The lowest and second lowest mean writing scores occurred

Table 9

Sample Sizes, Means of the Writing Outcomes, and Standard Deviations of the Writing Outcomes in the Low and High Categories of the Five SESAT Subtests

	Experimental (WTR)			Control (No-WTR)		
Subtest	N	Mean	SD	N	Mean	SD
Sounds & Letters						
Low Category	30	2.37	1.19	39	2.05	1.10
High Category	39	3.21	1.03	41	3.05	1.12
Word Reading						
Low Category	29	2.21	1.05	44	2.09	1.10
High Category	40	3.30	1.04	36	3.14	1.10
Listening						
Low Category	31	2.32	1.19	50	2.16	1.02
High Category	38	3.26	0.98	30	3.23	1.22
Mathematics						
Low Category	24	2.00	0.98	50	2.20	1.09
High Category	45	3.29	1.01	30	3.17	1.18
Environment						
Low Category	30	2.43	0.97	52	2.35	1.06
High Category	39	3.15	1.23	28	2.96	1.37

among the pupils with low sounds and letters achievement and low word reading achievement, respectively.

The average differential between the low and high achievement categories' writing scores was 0.96. Most of the differentials were near this average, as evidenced by the WTR average differential of 0.98 and the No-WTR average differential of 0.94.

Table 10 contains data on hours of language arts and writing instruction per week. As indicated in Chapter III, the actual measure used was minutes per week. As Table 10 shows, the Writing to Read pupils received almost 40 more minutes of language arts instruction time per week than did the No-WTR pupils. This resulted from the fact that the WTR group averaged about four more minutes per day on language arts instruction, and the No-WTR group averaged about four less minutes per day on language arts instruction, than the 180 minutes per day mandated by the Mississippi Department of Education (1989). Table 10 also shows that the WTR group received very nearly twice as much writing instruction time as did the No-WTR group. Any differences noted between the WTR and the No-WTR group writing outcomes may be attributed to the additional class time that the WTR group spent writing.

Table 11 provides the last of the descriptive data. In studies which employ holistic scoring to evaluate writing samples, it is common to provide the frequency of occurrence of each writing score within the experimental (WTR) and

Table 10

Hours of Language Arts (LA) and Writing Instruction Per Week

	Hrs of LA/Week*		Hrs Writing/Week*	
Group	Mean	SD	Mean	SD
Writing To Read	920.29	24.73	98.70	3.39
Non Writing To Read	880.50	28.28	49.88	7.07

*Measured in Minutes

Table 11

Experimental (WTR) and Control (No-WTR) Group Writing Outcome Frequencies

	Writing Score					
Group	1	2	3	4	5	6
WTR Group	11	15	22	16	5	0
No-WTR Group	17	25	20	13	4	1

control (No-WTR) groups. The scores range from a low score of 1 to a high score of 6. The writing score is a composite quantitative rating which reflects the degree to which the following qualitative characteristics were observed in a writing sample: (a) a clear and fluently expressed sample of writing, (b) a logical and organized story flowing from the story starter, (c) variation in sentence phrasing and structure, and (d) an interesting plot or control of the language. A complete characterization of the six writing scores appears in Appendix B.

The WTR group had 5 more pupils score a 3 (the ideas are apparent but not well developed) or above than did the No-WTR group despite the fact that the No-WTR group contained 11 more subjects. In the WTR group, 38% of the pupils scored a 1 or 2 (a list format is used; complex sentences distinguish a 2 from a 1); in comparison, 53% of the No-WTR group scored a 1 or 2.

Table 11 does not provide WTR and No-WTR group frequency distributions among the categories of the variables, for these distributions do not provide insight into possible causes for the differences between the WTR and No-WTR groups. A concerted effort has been made in this study to control for the effects of outside influences using multiple linear regression. This is not to say that frequency distributions are useless, but rather that their sole use has been a limiting factor in much of the Writing to Read research cited in Chapter II of this dissertation.

Tests of the Hypotheses

Testing the hypotheses was accomplished statistically within the framework of multiple linear regression. Significance was established at the 0.05 probability level.

Hypothesis 1

Hypothesis 1 stated: There will be a significant difference between the writing outcomes, as measured by holistic scoring, of first grade pupils who have experienced the WTR program and those who have had No-WTR program experience while controlling for gender, race, socioeconomic status, individual student learning style, attitude toward school, academic achievement, hours of language arts instruction per week, and hours of writing instruction per week.

The results of testing the hypothesis are found in Table 12, which reveals an $\underline{F}$ ratio of 7.161, $\underline{df}$= 1/132, a probability of 0.0084, a full model $\underline{R}^2$ of 0.4354, and an $\underline{R}^2$ change of 0.0306. Since this result was significant beyond the 0.05 level, research Hypothesis 1 was accepted. Thus, a significant difference between WTR and No-WTR first grade writing outcomes was found in favor of the experimental (WTR) group.

Hypothesis 2

Hypothesis 2 stated: There will be a significant difference between the writing outcomes, as measured by

Table 12

Results of Regression Analysis Comparing WTR and No-WTR Writing Outcomes Within the Total Sample of This Study

Group	Full Model R^2	R^2 Change	df	F	p
Total Sample	0.4354	0.0306	1/132	7.161	0.0084*

*$p < 0.05$

holistic scoring, of first grade pupils who have experienced the WTR program and those who have had No-WTR program experience within at least one of the gender categories while controlling for race, socioeconomic status, individual student learning style, attitude toward school, academic achievement, hours of language arts instruction per week, and hours of writing instruction per week.

The results of testing Hypothesis 2 are found in Table 13. Examination of the outcomes for male subjects reveals an $\underline{F}$ ratio of 2.974, $\underline{df}$= 1/47, a probability of 0.0912, a full model $\underline{R}^2$ of 0.5342, and an $\underline{R}^2$ change of 0.0295. In addition, examination of the outcomes for female subjects reveals an $\underline{F}$ ratio of 2.376, $\underline{df}$= 1/70, a probability of 0.1277, a full model $\underline{R}^2$ of 0.3992, and an $\underline{R}^2$ change of 0.0204. Thus, since the probability was greater than 0.05 for both males and females, research Hypothesis 2 was rejected. No significant difference was found between the writing outcomes of the WTR group and the No-WTR group within either category of the variable gender.

Hypothesis 3

Hypothesis 3 stated: There will be a significant difference between the writing outcomes, as measured by holistic scoring, of first grade pupils who have experienced the WTR program and those who have had No-WTR program experience within at least one of the racial categories while controlling for gender, socioeconomic status,

Table 13

Results of Regression Analysis Comparing WTR and No-WTR Writing Outcomes Within Each Category of Gender

Category	Full Model R^2	R^2 Change	df	F	p
Male	0.5342	0.0295	1/47	2.974	0.0912
Female	0.3992	0.0204	1/70	2.376	0.1277

Table 14

Results of Regression Analysis Comparing WTR and No-WTR Writing Outcomes Within Each Category of Race

Category	Full Model R^2	R^2 Change	df	F	p
Black	0.6996	0.0866	1/6	1.730	0.2364
White	0.4112	0.0234	1/113	4.494	0.0362*

*$p < 0.05$

individual student learning style, attitude toward school, academic achievement, hours of language arts instruction per week, and hours of writing instruction per week.

The results of testing Hypothesis 3 are found in Table 14. Examination of the data for black subjects reveals an F ratio of 1.730, df= 1/6, a probability of 0.2364, a full model R^2 of 0.6996, and an R^2 change of 0.0866. White subjects had a F ratio of 4.494, df= 1/113, a probability of 0.0362, a full model R^2 of 0.4112, and an R^2 change 0.0234. While the differences in writing outcomes among WTR and No-WTR black pupils was not significant, research Hypothesis 3 was accepted due to the significant difference in writing outcomes between WTR and No-WTR white pupils in favor of the experimental (WTR) group.

Hypothesis 4

Hypothesis 4 stated: There will be a significant difference between the writing outcomes, as measured by holistic scoring, of first grade pupils who have experienced the WTR program and those who have had No-WTR program experience within at least one of the socioeconomic status categories while controlling for gender, race, individual student learning style, attitude toward school, academic achievement, hours of language arts instruction per week, and hours of writing instruction per week.

The hypothesis test results are found in Table 15. The low socioeconomic status category had an F ratio of 2.051,

Table 15

Results of Regression Analysis Comparing WTR and No-WTR Writing Outcomes Within Each Socioeconomic Status Category

Category	Full Model R^2	R^2 Change	df	F	p
Low SES	0.4938	0.0192	1/54	2.051	0.1579
High SES	0.3769	0.0359	1/63	3.633	0.0612

df= 1/54, a probability of 0.1579, a full model R^2 of 0.4938, and an R^2 change of 0.0192. For the high socioeconomic status category, the test revealed an F ratio of 3.633, df= 1/63, a probability of 0.0612, a full model R^2 of 0.3769, and an R^2 change of 0.0359. Since no significant difference between WTR and No-WTR writing outcomes was found in either of the low or high socioeconomic status categories, research Hypothesis 4 was rejected.

Hypothesis 5

Hypothesis 5 stated: There will be a significant difference between the writing outcomes, as measured by holistic scoring, of first grade pupils who have experienced the WTR program and those who have had No-WTR program experience within at least one of the individual student learning style categories while controlling for gender, race, socioeconomic status, attitude toward school, academic achievement, hours of language arts instruction per week, and hours of writing instruction per week.

Hypothesis 5 test results are found in Table 16. The pupils with Learning Style I had an F ratio of 1.280, df= 1/15, a probability of 0.2758, a full model R^2 of 0.6991, and an R^2 change of 0.0257. For Learning Style II, the F ratio was 16.249, df= 1/14, with a probability of 0.0012, a full model R^2 of 0.8234, and an R^2 change of 0.2049. Learning Style III pupils had an F ratio of 1.489, df= 1/21, with a probability of 0.2359, a full model R^2 of

Table 16

Results of Regression Analysis Comparing WTR and No-WTR Writing Outcomes Within Each Individual Student Learning Style

Learning Style	Full Model R^2	R^2 Change	df	F	p
I	0.6991	0.0257	1/15	1.280	0.2758
II	0.8234	0.2049	1/14	16.249	0.0012*
III	0.4775	0.0371	1/21	1.489	0.2359
IV	0.4264	0.0001	1/35	0.004	0.9480

*$p < 0.05$

0.4775, and an $\underline{R}^2$ change of 0.0371. For Learning Style IV, the $\underline{F}$ ratio was 0.004, $\underline{df}$= 1/35, with a probability of 0.9480, a full model $\underline{R}^2$ of 0.4264, and an $\underline{R}^2$ change of 0.0001. Although there were no significant differences between the WTR and No-WTR first grade writing outcomes within the Learning Style I, III, and IV categories, research Hypothesis 5 was accepted due to the significant difference between WTR and No-WTR first grade writing outcomes among Learning Style II pupils in favor of the experimental (WTR) group.

Hypothesis 6

Hypothesis 6 stated: There will be a significant difference between the writing outcomes, as measured by holistic scoring, of first grade pupils who have experienced the WTR program and those who have had No-WTR program experience within at least one of the attitude toward school categories while controlling for gender, race, socioeconomic status, individual student learning style, academic achievement, hours of language arts instruction per week, and hours of writing instruction per week.

The testing of Hypothesis 6 required four subhypotheses, one for each of the attitude toward school subject areas (attitude toward reading and language arts, attitude toward mathematics, attitude toward science, and attitude toward social studies). The results of the statistical tests of these subhypotheses are presented below. Research Hypothesis 6 was accepted because research Hypotheses 6A and 6B were accepted, though Hypotheses 6C and 6D were rejected.

Hypothesis 6A

Hypothesis 6A stated: There will be a significant difference between the writing outcomes, as measured by holistic scoring, of first grade pupils who have experienced the WTR program and those who have had No-WTR program experience within the low or high attitude toward reading and language arts categories while controlling for gender, race, socioeconomic status, individual student learning style, the three remaining attitude toward school subject areas, academic achievement, hours of language arts instruction per week, and hours of writing instruction per week.

Table 17 features the results of testing Hypothesis 6A. Pupils with a propensity for low attitude toward reading and language arts produced an F ratio of 4.552, df= 1/44, a probability of 0.0385, a full model R^2 of 0.5468, and an R^2 change of 0.0469. The high attitude toward reading and language arts category had an F ratio of 2.720, df= 1/73, a probability of 0.1034, a full model R^2 of 0.3852, and an R^2 change of 0.0229. While differences in writing outcomes between WTR and No-WTR pupils with a high attitude toward reading and language arts were not significant, research Hypothesis 6A was accepted due to the significant difference between WTR and No-WTR writing outcomes within the low attitude toward reading and language arts category in favor of the experimental (WTR) group.

Hypothesis 6B

Hypothesis 6B stated: There will be a significant difference between the writing outcomes, as measured by holistic scoring, of first grade pupils who have experienced the WTR program and those who have had No-WTR program experience within the low or high attitude toward mathematics categories while controlling for gender, race, socioeconomic status, individual student learning style, the three remaining attitude toward school subject areas, academic achievement, hours of language arts instruction per week, and hours of writing instruction per week.

The results of testing the hypothesis are found in Table 17. Examination of the data regarding the low attitude toward mathematics category reveals an $\underline{F}$ ratio of 1.734, $\underline{df}$= 1/49, a probability of 0.1940, a full model $\underline{R}^2$ of 0.5107, and an $\underline{R}^2$ change of 0.0173. The high attitude toward mathematics category had an $\underline{F}$ ratio of 6.099, $\underline{df}$= 1/68, a probability of 0.0160, a full model $\underline{R}^2$ of 0.4873, and an $\underline{R}^2$ change of 0.0460. Although the difference between WTR and No-WTR writing outcomes of low attitude toward mathematics pupils was not significant, research Hypothesis 6B was accepted due to the significant difference in writing

Table 17

Results of Regression Analysis Comparing WTR and No-WTR Writing Outcomes Within the Low and High Categories of the Four SSA Subject Areas

Subject Area	Full Model R^2	R^2 Change	df	F	p
Reading and LA					
Low Category	0.5468	0.0469	1/44	4.552	0.0385*
High Category	0.3852	0.0229	1/73	2.720	0.1034
Mathematics					
Low Category	0.5107	0.0173	1/49	1.734	0.1940
High Category	0.4873	0.0460	1/68	6.099	0.0160*
Science					
Low Category	0.5142	0.0171	1/44	1.549	0.2198
High Category	0.4378	0.0188	1/73	2.446	0.1222
Social Studies					
Low Category	0.5556	0.0130	1/41	1.200	0.2797
High Category	0.4505	0.0256	1/76	3.537	0.0638

*$p < 0.05$

outcomes between the WTR and No-WTR high attitude toward mathematics pupils in favor of the experimental (WTR) group.

Hypothesis 6C

Hypothesis 6C stated: There will be a significant difference between the writing outcomes, as measured by holistic scoring, of first grade pupils who have experienced the WTR program and those who have had No-WTR program experience within the low or high attitude toward science categories while controlling for gender, race, socioeconomic status, individual student learning style, the three remaining attitude toward school subject areas, academic achievement, hours of language arts instruction per week, and hours of writing instruction per week.

The results of testing the hypothesis are found in Table 17. The low attitude toward science category had an F ratio of 1.549, df= 1/44, a probability of 0.2198, a full model R^2 of 0.5142, and an R^2 change of 0.0171. The high attitude toward science category had an F ratio of 2.446, df= 1/73, a probability of 0.1222, a full model R^2 of 0.4378, and an R^2 change of 0.0188. Since both the low and high attitude toward science categories showed no significant differences between the WTR and No-WTR writing outcomes, research Hypothesis 6C was not accepted.

Hypothesis 6D

Hypothesis 6D stated: There will be a significant difference between the writing outcomes, as measured by holistic scoring, of first grade pupils who have experienced the WTR program and those who have had No-WTR program experience within the low or high attitude toward social studies categories while controlling for gender, race, socioeconomic status, individual student learning style, the three remaining attitude toward school subject areas, academic achievement, hours of language arts instruction per week, and hours of writing instruction per week.

Hypothesis 6D test results are found in Table 17. The low attitude toward social studies category had an F ratio of 1.200, df= 1/41, a probability of 0.2797, a full model R^2 of 0.5556, and an R^2 change of 0.0130. The high attitude toward social studies category had an F ratio of 3.537, df= 1/76, a probability of 0.0638, a full model R^2 of 0.4505, and an R^2 change of 0.0256. Since neither result was significant, research Hypothesis 6D was rejected. Thus, no significant differences between the writing outcomes of the experimental (WTR) group and the control (No-WTR) group were found within the low and high categories of attitude toward social studies.

Hypothesis 7

Hypothesis 7 stated: There will be a significant difference between the writing outcomes, as measured by holistic scoring, of first grade pupils who have experienced the WTR program and those who have had No-WTR program experience within at least one of the academic achievement categories while controlling for gender, race, socioeconomic status, individual student learning style, attitude toward school, hours of language arts instruction per week, and hours of writing instruction per week.

The testing of Hypothesis 7 required five subhypotheses, one for each SESAT subtest of academic achievement (sounds and letters, word reading, listening to words and stories, mathematics, and environment). The results of the statistical tests of these subhypotheses are presented below. Research Hypothesis 7 was accepted because research Hypotheses 7A-7E were accepted.

Hypothesis 7A

Hypothesis 7A stated: There will be a significant difference between the writing outcomes, as measured by holistic scoring, of first grade pupils who have experienced the WTR program and those who have had No-WTR program experience within the low or high sounds and letters academic achievement categories while controlling for gender, race, socioeconomic status, individual student learning style, attitude toward school, the four remaining SESAT subtests of academic achievement, hours of language arts instruction per week, and hours of writing instruction per week.

The results of testing the hypothesis are found in Table 18. Examination of the data revealed an F ratio of 10.408, df= 1/53, a probability of 0.0022, a full model R^2

of 0.5417, and an $\underline{R}^2$ change of 0.0900 for the low achievement category, and an F ratio of 0.113, df= 1/64, a probability of 0.7380, a full model $\underline{R}^2$ of 0.2386, and an $\underline{R}^2$ change of 0.0013 for the high achievement category. While the difference between the WTR and No-WTR writing outcomes in the high achievement category was not significant, Hypothesis 7A was accepted due to the significant difference between WTR and No-WTR writing outcomes in the low sounds and letters achievement category in favor of the experimental (WTR) group.

Hypothesis 7B

Hypothesis 7B stated: There will be a significant difference between the writing outcomes, as measured by holistic scoring, of first grade pupils who have experienced the WTR program and those who have had No-WTR program experience within the low or high word reading academic achievement categories while controlling for gender, race, socioeconomic status, individual student learning style, attitude toward school, the four remaining SESAT subtests of academic achievement, hours of language arts instruction per week, and hours of writing instruction per week.

The results of testing the hypothesis are found in Table 18. Examination of the data revealed an F ratio of 19.051, df= 1/57, a probability of 0.0001, a full model $\underline{R}^2$ of 0.4935, and an $\underline{R}^2$ change of 0.1693 for the low achievement category, and an F ratio of 0.261, df= 1/60, a probability of 0.8722, a full model $\underline{R}^2$ of 0.2151, and an $\underline{R}^2$ change of 0.0003 for the high achievement category. While the difference between the WTR and No-WTR group writing outcomes in the high achievement category was not significant, Hypothesis 7B was accepted due to the significant difference between WTR and No-WTR writing outcomes within the low word reading achievement category in favor of the experimental (WTR) group.

Hypothesis 7C

Hypothesis 7C stated: There will be a significant difference between the writing outcomes, as measured by holistic scoring, of first grade pupils who have experienced the WTR program and those who have had No-WTR program experience within the low or high listening to words and stories academic achievement categories while controlling for gender, race, socioeconomic status, individual student learning style, attitude toward school, the four remaining SESAT subtests of academic achievement, hours of language arts instruction per week, and hours of writing instruction per week.

The results of testing the hypothesis are found in Table 18. Examination of the data revealed an $\underline{F}$ ratio of 18.959, $\underline{df}$= 1/65, a probability of 0.0000, a full model $\underline{R}^2$ of 0.5418, and an $\underline{R}^2$ change of 0.1337 for the low achievement category, and an $\underline{F}$ ratio of 0.294, $\underline{df}$= 1/52, a probability of 0.5899, a full model $\underline{R}^2$ of 0.2605, and an $\underline{R}^2$

change of 0.0042 for the high achievement category. While the difference between the WTR and No-WTR writing outcomes in the high achievement category was not significant, research Hypothesis 7C was accepted due to the significant difference between WTR and No-WTR group writing outcomes within the low listening to words and stories achievement category in favor of the experimental (WTR) group.

Hypothesis 7D

Hypothesis 7D stated: There will be a significant difference between the writing outcomes, as measured by holistic scoring, of first grade pupils who have experienced the WTR program and those who have had No-WTR program experience within the low or high mathematics academic achievement categories while controlling for gender, race, socioeconomic status, individual student learning style, attitude toward school, the four remaining SESAT subtests of academic achievement, hours of language arts instruction per week, and hours of writing instruction per week.

The results of testing the hypothesis are found in Table 18. Examination of the data revealed an $\underline{F}$ ratio of 4.610, $\underline{df}$= 1/58, a probability of 0.0360, a full model $\underline{R}^2$ of 0.5109, and an $\underline{R}^2$ change of 0.0389 for the low achievement category; the high achievement category had an $\underline{F}$ ratio of 0.880, $\underline{df}$= 1/59, a probability of 0.3520, a full model $\underline{R}^2$ of 0.2686, and an $\underline{R}^2$ change of 0.0109. While the difference between the WTR and No-WTR writing outcomes in the high achievement category was not significant, research Hypothesis 7D was accepted due to the significant difference between WTR and No-WTR writing outcomes in the low mathematics achievement category in favor of the experimental (WTR) group.

Hypothesis 7E

Hypothesis 7E stated: There will be a significant difference between the writing outcomes, as measured by holistic scoring, of first grade pupils who have experienced the WTR program and those who have had No-WTR program experience within the low or high environment academic achievement categories while controlling for gender, race, socioeconomic status, individual student learning style, attitude toward school, the four remaining SESAT subtests of academic achievement, hours of language arts instruction per week, and hours of writing instruction per week.

The results of testing the hypothesis are found in Table 18. Examination of the data revealed an F ratio of 11.923, df= 1/66, a probability of 0.0010, a full model R^2 of 0.5205, and an R^2 change of 0.0866 for the low achievement category, and an F ratio of 0.170, df= 1/51, a probability of 0.6816, a full model R^2 of 0.3823, and an R^2 change of 0.0021 for the high achievement category. While the difference between the WTR and No-WTR writing outcomes in the high achievement category was not significant, research Hypothesis 7E was accepted due to the significant

Table 18

Results of Regression Analysis Comparing WTR and No-WTR Writing Outcomes Within the Low and High Categories of the Five SESAT Subtests

Subtest	Full Model R^2	R^2 Change	df	F	p
Sounds & Letters					
Low Category	0.5417	0.0900	1/53	10.408	0.0022^*
High Category	0.2386	0.0013	1/64	0.113	0.7380
Word Reading					
Low Category	0.4935	0.1693	1/57	19.051	0.0001^*
High Category	0.2151	0.0003	1/60	0.261	0.8722
Listening					
Low Category	0.5418	0.1337	1/65	18.959	0.0000^*
High Category	0.2605	0.0042	1/52	0.294	0.5899
Mathematics					
Low Category	0.5109	0.0389	1/58	4.610	0.0360^*
High Category	0.2686	0.0109	1/59	0.880	0.3520
Environment					
Low Category	0.5205	0.0866	1/66	11.923	0.0010^*
High Category	0.3823	0.0021	1/51	0.710	0.6816

$^*p < 0.05$

difference between WTR and No-WTR writing outcomes within the low environment achievement category in favor of the experimental (WTR) group.

Hypothesis 8

Hypothesis 8 stated: There will be a significant relationship between first grade writing outcomes, as measured by holistic scoring, and hours of language arts instruction per week within the WTR or No-WTR groups while controlling for gender, race, socioeconomic status, individual student learning style, attitude toward school, academic achievement, and hours of writing instruction per week.

Hypothesis 8 test results are found in Table 19. The WTR group showed an F ratio of 0.543, df= 1/53, a probability of 0.4646, a full model R^2 of 0.5975, and an R^2 change of 0.0041. The No-WTR group had an F ratio of 1.889, df= 1/65, a probability of 0.1741, a full model R^2 of 0.3982, and an R^2 change of 0.0175. Thus, since first grade writing outcomes were not significantly related to hours of language arts instruction per week in both the WTR and No-WTR groups, research Hypothesis 8 was rejected.

Hypothesis 9

Hypothesis 9 stated: There will be a significant relationship between first grade writing outcomes, as measured by holistic scoring, and hours of writing instruction per week within the WTR or No-WTR groups while controlling for gender, race, socioeconomic status, individual student learning style, attitude toward school, academic achievement, and hours of language arts instruction per week.

The results of testing the hypothesis are found in Table 20. The WTR group had an F ratio of 13.675, df= 1/53, a probability of 0.0005, a full model R^2 of 0.5975, and an R^2 change of 0.1039. The No-WTR group had an F ratio of 1.889, df= 1/65, a probability of 0.1741, a full model R^2 of 0.3982, and an R^2 change of 0.0175. While first grade writing outcomes were not significantly related to hours of writing instruction per week in the No-WTR group, the relationship between first grade writing outcomes and hours of writing instruction per week was significant within the WTR group. Thus, research Hypothesis 9 was accepted for the Writing to Read sample. Furthermore, the positive correlation between the writing outcomes and hours of writing instruction per week indicated that those WTR pupils who had higher writing scores also tended to have received more hours of writing instruction per week.

Table 19

Results of Regression Analysis on the Effect of Hours of Language Arts Instruction Per Week on Writing Outcomes Within the WTR and No-WTR Groups

Group	Full Model R^2	R^2 Change	*df*	*F*	*p*
WTR Group	0.5975	0.0041	1/53	0.543	0.4646
No-WTR Group	0.3982	0.0175	1/65	1.889	0.1741

Table 20

Results of Regression Analysis on the Effect of Hours of Writing Instruction Per Week on Writing Outcomes Within the WTR and No-WTR Groups

Group	Full Model R^2	R^2 Change	df	F	p
WTR Group	0.5975	0.1039	1/53	13.675	0.0005*
No-WTR Group	0.3982	0.0175	1/65	1.889	0.1741

*$p < 0.05$

Summary

The descriptive data in this chapter revealed that the mean writing scores of the WTR pupils were slightly higher than those of the No-WTR pupils in all categories except pupils with Learning Style III (high cognitive development and low self-concept) and with low mathematics achievement. Testing the research hypotheses revealed that the WTR writing outcomes were significantly different from the No-WTR writing outcomes in favor of the WTR group. In addition, this positive significant effect of Writing to Read on first grade writing outcomes was observed among pupils with white racial affiliation, Learning Style II (low cognitive development and low self-concept), low attitude toward reading and language arts, high attitude toward mathematics, and low academic achievement with the exception that the WTR pupils with low mathematics achievement scored significantly lower than the No-WTR pupils with low mathematics achievement.

In contrast, no significant differences were noted between the WTR and No-WTR first grade writing outcomes in either of the gender categories, in the black racial category, nor in either of the socioeconomic status categories. Furthermore, a significant difference between WTR and No-WTR first grade writing outcomes was not found in any of the attitude toward school categories except the two listed above, nor in any of the high academic achievement categories.

Finally, no significant relationship was found between first grade writing outcomes and hours of language arts instruction per week in either of the WTR or No-WTR groups. Moreover, no significant relationship between first grade writing outcomes and hours of writing instruction per week was found in the No-WTR group. However, in the WTR group, there was a significant relationship between first grade writing outcomes and hours of writing instruction per week.

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

This chapter presents a summary of the findings of this research under the headings of Purpose of the Study, Summary of the Procedures, Summary of Major Findings, Limitations, and Discussion of Major Findings. The conclusions and implications of this research are then discussed, and a list of recommendations for further research are outlined.

Purpose of the Study

The general purpose of this study was to examine the differential effects on first grade writing outcomes of the Writing to Read (WTR) program when integrated within the language arts curriculum in contrast to the writing outcomes of first grade pupils who received traditional language arts instruction (No-WTR) while controlling for gender, race, socioeconomic status, individual student learning style, attitude toward school, academic achievement, hours of language arts instruction per week, and hours of writing instruction per week. The ultimate goal of this study was to provide educators with insights into the efficacy of the Writing to Read program as an aid for improving composing skills.

A specific purpose of this study was to determine if the mean writing scores of the experimental (WTR) and control (No-WTR) groups were significantly different. In addition, this study sought to identify the types of pupils whose writing proficiency was significantly effected by Writing to Read.

Summary of the Procedures

The sample of the study was drawn from the first grade population of two rural elementary schools in a southern Mississippi county public school district. The five classes of first grade pupils at one school experienced the Writing to Read (WTR) program as part of the traditional language arts curriculum while the four classes of first grade pupils at the other school received more traditional language arts instruction in lieu of Writing to Read.

Sixty-nine of the 118 first grade pupils in the WTR school were included in the experimental group, and eighty of the 100 first grade pupils from the No-WTR school constituted the control group. The pupils not included in the study were rejected for one of the following reasons: They did not (a) have parent or guardian consent to participate in the study, (b) complete a writing sample and a Survey of School Attitudes, or (c) complete the Stanford Early School Achievement Test, Level 1, on April 17, 1989, while in kindergarten.

From October 2, 1989, to February 16, 1990, pupils in the experimental (WTR) group experienced an average of 300 minutes per week of Writing to Read program instruction and an average of 620 minutes per week of traditional language arts instruction utilizing textbooks, workbooks, and other varied instructional materials. Included in this time for language arts instruction was an average of 98.70 minutes of writing instruction per week. From October 2, 1989, to February 16, 1990, the pupils in the control (No-WTR) group experienced on average 880.50 minutes per week of traditional language arts instruction utilizing textbooks, workbooks, and other varied instructional materials, of which an average of 49.88 minutes per week was writing instruction.

The administration of the Survey of School Attitudes (SSA) and the writing sample experience were proctored by nine testers with the help of the classroom teachers and teaching assistants on April 4-5, 1990, in the No-WTR and the WTR schools, respectively. In addition, the classroom teachers were asked to identify the amount of time they dedicated per week to language arts instruction and writing instruction. The classroom teachers were also asked to complete a Learning Style Identification Scale between May 17-28, 1990, for each pupil who completed the SSA and writing sample. During this time, information on gender, race, socioeconomic status, and academic achievement were gathered from school records.

Subsequent considerations regarding the sample population employed in this study prompted the redefinition of some of variables in this study. First, the category 'other' was deleted from the variable race since all of the pupils in this study were identified as either black or white. With regard to socioeconomic status (SES), the free lunch and reduced lunch categories were combined to form the low SES category since only six pupils paid the reduced price for lunch; the high SES category was composed of the pupils who paid the full price for lunch. Another procedural factor involved the amalgamation of Learning Styles IV and V. This modification was made possible by the congruence of cognitive development and self-concept in Style IV and V pupils (Malcom, Lutz, Gerken and Hoeltke, 1981a), and made necessary by the small number, 7, of Style V pupils. With regard to attitude toward school, a division of raw scores into categories of low and high attitude was performed. The mean raw score within each attitude subject area of reading and language arts, mathematics, science, and social studies became the threshold raw score between the low and high attitude categories of each respective attitude subject area. Finally, the mean of the national percentile scores of this study's population on each SESAT subtest of sounds and letters, word reading, listening to words and stories, mathematics, and environment was used as the threshold score between the low and high academic achievement categories for each respective SESAT subtest.

Summary of Major Findings

A detailed analysis of descriptive data and the tests of the research hypotheses are presented in Chapter IV. The major findings of this study are summarized below.

Descriptive Data

1. The mean writing score, 2.84, of pupils in the Writing to Read (WTR) group was 0.28 points higher than the mean writing score, 2.56, of the pupils in the No-WTR group.

2. The mean writing score of pupils in the WTR group was higher than the mean writing score of pupils in the No-WTR group within the categories of the variables gender, race, and socioeconomic status.

3. Group comparison of pupil learning style categories and mean writing scores revealed that pupils in the WTR group had a higher mean writing score than the No-WTR group within the Learning Style I, II, and IV categories. The No-WTR group had a higher mean writing score than did the WTR grcup by 0.30 points in the Learning Style III category.

4. In both the low and high attitude categories of all four attitude measures (reading and language arts, mathematics, science, and social studies) of the Survey of School Attitudes, pupils in the WTR group had higher mean writing scores than the pupils in the No-WTR group.

5. Similarly, in both the low and high academic achievement categories in all five achievement measures (sounds and letters, word reading, listening to words and stories, mathematics, and environment) of the Stanford Early School Achievement Test, Level 1, the WTR group had a higher mean writing score than the No-WTR group with the exception of the low mathematics achievement category, in which the control (No-WTR) group had a mean writing score of 2.20 and the experimental (WTR) group had a mean writing score of 2.00.

Tests of the Hypotheses

Multiple linear regression was employed in testing the research hypotheses. Of the nine hypotheses stated in

Chapter I, six were accepted. The major results from testing the hypotheses were as follows:

Hypothesis 1, which stated that there would be a significant difference between the WTR and No-WTR writing outcomes while holding constant gender, race, socioeconomic status, individual student learning style, attitude toward school, academic achievement, hours of language arts instruction per week, and hours of writing instruction per week, was substantiated in favor of the WTR group.

Hypothesis 2, which stated that there would be a significant difference between the WTR and No-WTR writing outcomes within gender categories while holding constant race, socioeconomic status, individual student learning style, attitude toward school, academic achievement, hours of language arts instruction per week, and hours of writing instruction per week, was not substantiated.

Hypothesis 3, which stated that there would be a significant difference between the WTR and No-WTR writing outcomes within racial categories while holding constant gender, socioeconomic status, individual student learning style, attitude toward school, academic achievement, hours of language arts instruction per week, and hours of writing instruction per week, was substantiated due to the significant result found in the white sample population in favor of the WTR group.

Hypothesis 4, which stated that there would be a significant difference between the WTR and No-WTR writing outcomes within the categories of socioeconomic status while holding constant gender, race, individual student learning style, attitude toward school, academic achievement, hours of language arts instruction per week, and hours of writing instruction per week, was not substantiated.

Hypothesis 5, which stated that there would be a significant difference between the WTR and No-WTR writing outcomes within the individual student learning style categories while holding constant gender, race, socioeconomic status, attitude toward school, academic achievement, hours of language arts instruction per week, and hours of writing instruction per week, was substantiated due to the significant difference between the WTR and No-WTR writing outcomes in the Learning Style II sample in favor of the WTR group.

Hypothesis 6, which stated that there would be a significant difference between the WTR and No-WTR writing outcomes within the categories of attitude toward school while holding constant gender, race, socioeconomic status, individual student learning style, academic achievement, hours of language arts instruction per week, and hours of writing instruction per week, was substantiated due to the significant differences between the WTR and No-WTR writing outcomes in the low attitude toward reading and language arts category and the high attitude toward mathematics category in favor of the WTR group.

Hypothesis 7, which stated that there would be a significant difference between the WTR and No-WTR writing outcomes within the categories of academic achievement while holding constant gender, race, socioeconomic status, individual student learning style, attitude toward school, hours of language arts instruction per week, and hours of writing instruction per week, was substantiated for all low academic achievement categories. The significant difference was in favor of the WTR group in all low achievement categories except the low mathematics achievement category.

Hypothesis 8, which stated that there would be a significant relationship between writing outcomes and hours of language arts instruction per week according to group membership in the WTR group or the No-WTR group while holding constant gender, race, socioeconomic status, individual student learning style, attitude toward school, academic achievement, and hours of writing instruction per week, was not substantiated.

Hypothesis 9, which stated that there would be a significant relationship between writing outcomes and hours of writing instruction per week according to group membership in the WTR group or the No-WTR group while holding constant gender, race, socioeconomic status, individual student learning style, attitude toward school, academic achievement, and hours of language arts instruction per week, was substantiated for the WTR group, but not for the No-WTR group.

Limitations

Candid evaluation and consideration of the design of this study warranted recognition of the following inherent limitations.

1. There was a disparity of 11 pupils between the WTR and the No-WTR sample sizes. The WTR sample size was 69 out of a possible 118 first grade pupils while the No-WTR sample size was 80 out of a possible 100 first grade pupils.

2. The sample examined in this study had a limited racial diversity-- only 13.4% were black pupils.

3. The measures of attitude toward school were unified into low and high categories. This generalization prevented striation of the results, but caused some loss of specificity about the individual subjects within the categories.

4. Similarly, the measures of academic achievement were also unified into low and high categories, and the limitations listed in number 3 also apply here.

5. This study did not account for varied teaching styles. The pupils were identified only by WTR or No-WTR group membership.

6. Because hours of language arts instruction per week and hours of writing instruction per week were not varied intentionally by the researcher as part of the treatment, their effects could not be examined independently in this study.

7. In addition, non-random assignment of first grade pupils into classes may have influenced the results found in Hypotheses 8 and 9.

Discussion of Major Findings

The Writing to Read computer education program is an expensive program, a fact that warrants research into its practical benefits. Several studies have claimed that Writing to Read causes a significant difference in writing outcomes (Brierley, 1987; Educational Testing Service, 1984; Gold & McKenzie, 1988; Haines & Turner, 1987; Leahy, 1989; Leahy & Zennie, 1988; Levinson & Lalor, 1989; Moilanen, 1986; Naron & Elliot, 1987; Spillman, Hutchcraft, Olliff, Lutz, & Kray, 1986; Whitmer & Miller, 1987). Indeed, this study also found the writing outcomes of first grade WTR pupils to be significantly different from the first grade No-WTR writing outcomes. However, educators must remain cognizant of the difference between significance in statistical terms and practical significance. For example, the mean difference in writing scores between the experimental (WTR) and control

(No-WTR) groups in this study was quite small-- only 0.28 points. The word 'significant' does not imply that a large difference exists, but rather that a significant portion of the observed difference, however small, can be attributed to a particular treatment. Thus, it remains to be seen whether the Writing to Read program can provide practical benefits commensurate with its cost. Moreover, can the writing instruction methodologies such as daily writing and free-writing be effectively employed without the purchase of expensive computer equipment and software?

Another specific purpose of this study, as cited in Chapter I, was to identify which characteristics of the pupils in this study were associated with significant differences in writing outcomes between the WTR and No-WTR groups. An examination of gender categories showed that neither the writing scores of males nor females in this study were significantly related to group membership in the Writing to Read program. Thus, gender was not a determining factor in explaining the writing differences between the WTR and No-WTR groups. Likewise, the difference between WTR and No-WTR writing outcomes was not significant for black pupils, neither the low nor high socioeconomic status categories, nor any of the Learning Style I (low cognitive development and high self-concept), III (high cognitive development and low self-concept), and IV (high cognitive development and high self-concept) categories. In addition, the differences in writing outcomes between WTR and No-WTR pupils were not significant in the high attitude toward reading and language arts and the low attitude toward mathematics categories, nor in either of the low or high categories of both the attitude toward science and the attitude toward social studies subject areas. However, white racial affiliation, Learning Style II, low attitude toward reading and language arts, high attitude toward mathematics, and low academic achievement were all pupil characteristics which explained a significant portion of the differences in writing outcomes between the WTR and No-WTR groups.

One of the most prominent results found in this research is that the WTR and No-WTR writing outcomes were significantly different within all of the low academic achievement categories. Of particular note was the fact that WTR pupils with low achievement in the language arts subtest areas of sounds and letters, word reading, and listening to words and stories had significantly higher writing scores than their No-WTR counterparts. As indicated by Zurn (1988), a primary writing concern of grade one pupils is the development of "some kind of spelling system [yet] the knowledge they already have and the resources they use for spelling are not the same" (p. 175). Thus, it is plausible that the phoneme-based approach provides a system of spelling to low language arts achievers who would otherwise have taken much longer to develop a system independently. Without the confusion of having to rethink spelling each time a word was needed, low language arts achievers could focus "on the meaning that their words conveyed and on the messages that could be constructed with words" (p.176). This could also explain why the writing outcomes of high language arts achievers in the WTR group were not significantly different from those of the No-WTR group, for most of the high language arts achievers, whether in the WTR or No-WTR group, had probably developed a workable personalized spelling system by the end of their first grade year when this study was conducted.

The development of a plausible explanation for the significantly lower writing scores of the WTR low mathematics achievers in comparison to the No-WTR low mathematics achievers is much more tenuous. As Papert (1980) suggests, using computers requires "thinking like a computer," or thinking in a more logical/mathematical fashion. Thus, it is possible that low math achievers have a difficult time with the computer component of Writing to Read. The significantly positive result of Writing to Read on high math attitude pupils lends credence to this conjecture. Furthermore, the insignificant relationship between WTR and No-WTR writing outcomes within the high mathematics achievement category does not detract from these statements for two reasons: (a) Both the WTR and No-WTR pupils with high mathematics achievement already think in a more logical/mathematical fashion, and (b) a significant relationship between attitude and achievement has not been found (Hogan, 1975b). In the end, more research is needed to determine if these explanations are correct.

The intent of Hypotheses 8 and 9 was to attempt to discern whether increased hours of instruction played a major role in any significant effects which may have been found in favor of the Writing to Read program. However, due to the experimental limitation of the researcher's inability to intentionally vary hours of instruction as part of the treatment, no assertions can be made in that regard. This poses no problem except in analysis of the significant relationship found between writing outcomes and hours of writing instruction in the WTR group. The following factors must be considered:

1) The variable of hours of writing instruction was constant at 100 minutes per week except in Class 1, which received only 90 minutes per week.

2) The pupils in the WTR group were not randomly assigned to classrooms, and Classroom 1 was the 'low functioning' class.

Thus, while the limitations of non-random class assignments were avoided throughout the rest of this study because the WTR group contained a large sample from every first grade class, the significant relationship between writing outcomes and hours of writing instruction may very well have been due to this non-random assignment.

Conclusions and Implications

The conclusions and implications were based upon and restricted to the findings of this study as follows:

1. Pupils who experienced the Writing to Read (WTR) program had a greater mean writing score than that of pupils who experienced the traditional language arts curriculum; the difference was found to be significant, though small.

2. The experimental Writing to Read program produced a significant difference between the writing outcomes of the experimental (WTR) group and the writing outcomes of the control (No-WTR) group among white pupils, pupils with Learning Style II, pupils with low attitude toward reading and language arts, pupils with high attitude toward mathematics, and all low academic achievement categories. The significant differences were in favor of the Writing to Read (WTR) group in all categories cited above except the low mathematics achievement category.

The findings reported in this study have implications which may be beneficial to those planning educational programs which include Writing to Read. Those professionals interested in these implications include researchers who evaluate program effectiveness as well as administrators and teachers who contemplate the implementation of the Writing to Read program in their school.

From the conclusions indicated in this study, it appears that some benefit in writing outcomes may be gained by using the Writing to Read program. However, the small difference in mean writing scores between the experimental (WTR) group and the control (No-WTR) group may not justify the purchase of the expensive computer system and the hiring of additional technical staff to help operate the system.

Recommendations

The following recommendations are based on the discoveries resulting from the tests of the research hypotheses on this study's first grade sample population.

1. This study was conducted during the first year of implementation of the Writing to Read program. Once the program is well in place, different results may occur. Therefore, it is recommended that research on the Writing to Read program be ongoing and of a longitudinal nature within this school district.

2. More research is needed to compare Writing to Read with writing process classes which employ daily practice, free-writing, and the other writing instruction techniques proposed in Writing to Read; the poignant question is whether the expensive computer equipment is needed to gain significant-- and more sizable-- benefits from those writing instruction methods. Implied in this recommendation is the importance of distinguishing the role of the computer from the role of hours of instruction.

3. The differences between the WTR and No-WTR groups within each gender category was much less manifest.

This seems to contradict other results which indicate an interaction between Writing to Read writing outcomes and gender (Haines & Turner, 1987; Whitmer & Miller, 1987). However, since many other studies did not account for outside influences, their results may be inaccurate. Further research which does account for outside influences is needed to verify the results found in this study.

4. While this study's results seems to indicate that white pupils benefit from Writing to Read and black pupils do not, further research is needed due to this study's limitation of a very small black population (13.4%).

5. Further research is also needed in the area of socioeconomic status because the insignificant results found in this study contradict other studies, which found that high socioeconomic status categories tend to experience significant benefits from Writing to Read whereas low socioeconomic status categories usually do not. (Haines & Turner, 1987; Naron & Elliot, 1987). More research which accounts for external variables is needed to verify the results found in this study.

6. The significantly positive results of Writing to Read on Learning Style II is particularly important since, as Malcolm, Lutz, Gerken, and Hoeltke (1981a) indicate, there is usually a preponderance of Learning Style II (low cognitive development and low self-concept) and III (high cognitive development and low self-concept) pupils in grades 1-3, which indicates that low self-concept seems to

predominate in primary grade pupils. The population in this study showed that trend, mainly because of the No-WTR group. However, the WTR group showed very low numbers in the Learning Style II and III categories, and high numbers in the Learning Style I and IV categories, which are both characterized by high self-concept. Further research should be conducted to determine whether this was coincidental or whether Writing to Read enhances self-concept and use of intrapersonal information in the primary grades.

7. The significant result of the Writing to Read program on all low academic achievement categories is very notable since the result was found in five different achievement measures. However, more research is needed on academic achievement and the Writing to Read program for two reasons. First, the significant effect of Writing to Read on the writing outcomes of low math achievers was negative, yet Writing to Read had a significant positive effect on the writing outcomes of high math attitude pupils. Second, the language arts components of the SESAT are the sounds and letters, word reading, and listening to words and stories subtests; on those subtests, the WTR low achievers had significantly higher writing scores than the No-WTR low achievers. Perhaps, this result occurred because Writing to Read emphasizes practice in these areas. This conjecture is made even more plausible by the fact that the Writing to Read program significantly influenced the writing scores of pupils with a low attitude toward reading and language arts.

APPENDIX A

LETTERS

LAMAR COUNTY

DEPARTMENT OF EDUCATION
Emil Pav, Jr., Superintendent

POST OFFICE BOX 609, PURVIS, MISSISSIPPI 39475

December 27, 1989

Wanda A. Boyer
SS Box 7771
Hattiesburg, Mississippi 39406

Re: Research Proposal Involving the Writing-to-Read Program in Lamar County Elementary Schools

Dear Ms. Boyer:

Please be advised that the Lamar County Board of Education has accepted your request to conduct research in designated elementary schools in Lamar County. Upon your return from Canada, I will be happy to discuss this with you and make any necessary arrangements from my office to the schools of your interests. Please feel free to contact me upon your return.

Sincerely,

Emil Pav Jr.
Emil Pav, Jr., Superintendent

"Striving for Educational Excellence"

University of Southern Mississippi
Office of Research & Sponsored Programs

HUMAN SUBJECTS PROTECTION REVIEW COMMITTEE
NOTICE OF COMMITTEE ACTION

Date: 2/19/90

TO: Wanda Arleen Rumson Boyer

Your project The Effects of The Writing to Read Program on First Grade Writing Outcomes has been determined to fall under one of the following categories:

1. Approved under the provisions for Expedited Review.
2. Approved by the HSPRC.
3. Disapproved by the HSPRC.
4. [✓ x] Exempt from formal HSPRC action.

The approved project period is March, 1990 to May, 1990. If project continues after this period, resubmit an application for review.

Criteria for Review

- risks to subjects are minimized;
- risks to subjects are reasonable in relation in anticipated benefits;
- selection of subjects is equitable;
- informed consent is adequate and appropriately documented;
- where appropriate, the research plan makes adequate provision for monitoring the data collected to ensure the safety of subjects;
- where appropriate, there are adequate provisions to protect the privacy of subjects and to maintain the confidentiality of data; and
- appropriate additional safeguards have been included to protect vulnerable subjects.

Donald R. Cotten
Chairman's Signature

2/19/90
Date

PARENTAL/GUARDIAN CONSENT FORM

March 26, 1990.

Dear Parent or Guardian:

I am a doctoral student at the University of Southern Mississippi. I am presently working on my dissertation which deals with the effects of the Writing to Read computer program on the writing of first grade pupils.

I need your permission for your first grade child to participate in this endeavor. Basic demographic information and academic achievement will be identified through school records. In addition, your child will have one writing experience and one opportunity to identify how he/she feels about school. Your child's learning style will also be identified using a standard Learning Style Identification Scale.

The instructions for the writing exercise and the attitude toward school questionnaire will be given by the child's regular teachers and will be part of the regular daily schedule. In addition, your child's classroom teacher will fill out a questionnaire which will identify your child's learning style.

At no time is your child under any physical, psychological, or sociological stress or risks since the evaluations do not involve any procedure that is not normally done in the first grade-- creative writing, checking attitude toward school with a questionnaire, and identification of learning style by the teacher. Furthermore, strict confidentiality of all results will be maintained. In no instance will your child's name and information be given to outside sources or third parties.

I hope that the data obtained in this study will provide information to help first grade educators determine a better way to teach writing to young children. Your child will benefit from the opportunity to write stories.

The explanation given in this letter and the consent form have been approved by the Human Subjects Protection Review Committee at the University of Southern Mississippi to assure that the research follows federal regulations. If you have any questions about this, please call the Director of Research and Sponsored Programs at 266-4119.

You may withdraw your child from participation in this study at any time without penalty or prejudice. You will be informed if any new information develops during the study that might affect your willingness to allow your child to continue participation.

Please sign the attached form to indicate that you have read this explanation and are willing to participate. Thank you for your help.

Wanda Arleen Rumson Boyer
Wanda Arleen Rumson Boyer

PARENT'S/GUARDIAN'S RELEASE FORM

My child, ______________________________, has permission to participate in a variety of educational experiences offered by the school. It is my understanding that the effectiveness of the first grade "Writing to Read" computer program will be assessed during the first grade year and, possibly, during grades 2 and 3 to determine the long term effects of this computer program.

____
PARENT'S/GUARDIAN'S SIGNATURE

____
DATE

March 26, 1990.

Dear First Grade Teachers and Teaching Assistants:

I thank you very much for your support of this project. I realize that an extra burden is placed on you, and I am doing everything I can to minimize it. On April 4th or 5th from 8:10 a.m.until 10:00 a.m., a team of testers will be coming to administer an attitude scale and acquire a writing sample from each pupil. I only ask that you participate at the beginning of the writing sample. Educational Testing Service recommends that the classroom teacher read the following text to the pupils and place the story starter on the chalkboard.

Directions: After you have distributed pencils and paper please tell the children to write their names at the top of their papers.

Then read aloud:

Today you will be writing a story all by yourself. I can't help you but I know you will do the best you can. I'm going to read a little story first. Listen.

Once upon a time when a little boy and a little girl were walking home from school, they found two magic hats. Because the hats were magic, when they put the hats on they could do anything they wished. They could fly up in the sky; they could be clowns in the circus; they could go to the moon, They could even eat all the ice cream in the world. They had a wonderful time.

Now . . . just think what you could do if you found a magic hat. Let's write a make-believe story about what you would do if you found a magic hat. Remember, you can do or be anything you wish. Start your story like this:
One day I found a magic hat

(Print the following stem on the board)

One day I found a magic hat . . .

(The children should begin the writing after they have been given the opportunity to pose any questions they may have about the writing. The children should be encouraged to write and do the best they can.)

Teacher assistance: Once you have completed the directions for writing the story and after you have read the stimulus and answered any questions, please do not assist the students in writing their stories, spelling words, etc.

This session will last thirty (30) minutes. At this point you as a teacher may either allow the tester to read the script for the attitude scale or you may choose to read it yourself, whichever is more convenient. The attitude scale is administered in two twenty minute sessions. The following schedule which will be followed for administration of these tests on April 4-5, 1990.

8:10 - 8:30	First part of attitude scale is administered.
8:30 - 8:40	Break for children.
8:40 - 9:10	Writing sample acquired.
9:10 - 9:20	Break for children.
9:20 - 9:40	Second part of the attitude scale is administered.

All testing should be completed no later than 10:00 a.m. Thank you very much for your participation. I am

Sincerely yours,
Wanda A R. Boyer
Wanda A. R. Boyer

May 24, 1990.

Dear Marti and Howard,

Enclosed in this box are the following:

(1) two sets of all 190 writing samples in scrambled order.

(2) one copy of Mary Fowles' "Report of the Meeting."

(3) two copies of the "Writing Assessment Instructions" which I gave to the teachers and the trained tester I had administer the tests for me.

(4) two copies of the "First Grade Writing Criteria."

(5) one copy of the ETS sheet labelled "Scoring of Writing Samples Written By First Grade Children" (This includes samples of writing which Educational Testing Service evaluated and scored. These samples could be used as a check to see if your scores are comparable before you begin the evaluation of the writing samples from Mississippi).

(6) post-it correction and cover-up tape so that your scores and Howard's are covered while you evaluate the writing samples so that your grades will not be biased.

(7) and a cheque for the cost of return postage.

In preparation for the interscorer reading, there are two copies of the first grade writing criteria. Please read each paper a first time to decipher it and a second time to judge the paper (assigning a mark to the sample at this time). Please be aware that the spelling and punctuation may be innovative and should not be judged. For these papers which are not on the scale from 1-6, the following categories can be used: Blank or Non-Verbal Response, Off-Topic, and Undecipherable (these categories are defined on the second page of the "First Grade [Writing] Criteria." If you and Howard differ in the assignment of a score by more than one point on a particular writing sample, then a third reviewer will read the writing samples and make the final judgement on the score. If you only differ in scores by one point, could you please re-read the writing sample and resolve the discrepancy.

Once the first round of reading is complete could you and Howard please read and score the second stack of writing samples another day. This will ensure that the scores are consistent from one day to the next. Once again any disagreement in the scores by more than point will be resolved by a third reviewer.

Thank you for your help Marti and Howard.

Sincerely,

Wanda A. R. Boyer
Wanda A. R. Boyer

APPENDIX B

WRITING SAMPLE ASSESSMENT INSTRUCTIONS

adapted from Appendix A of Fowles (1984)

Writing Assessment Instructions

Collection of Writing Samples

1. Date of assessment: Writing samples should be collected April 4-5, 1990.

2. Materials: Pupils should use the regular pencils that they normally use for writing and paper from the Primary Writing Tablet which is enclosed for your convenience.

3. Length of time: After the directions have been given and questions answered, the children are to be given 30 minutes to write one copy of their story.

4. Teacher assistance: Once you have completed the directions for writing the story and after you have read the stimulus and answered any questions, please do not assist the pupils in writing their stories, spelling words, etc.

5. Directions: After you have distributed pencils and paper please tell the children to write their names at the top of their papers. Then read:

Today you will be writing a story all by yourself. I can't help you but I know you will do the best you can. I'm going to read a little story first. Listen.

Once upon a time when a little boy and a little girl were walking home from school, they found two magic hats. Because the hats were magic, when they put the hats on they could do anything they wished. They could fly up in the sky; they could be clowns in the circus; they could go to the moon. They could even eat all the ice cream in the world. They had a wonderful time.

Now... just think what you could do if you found a magic hat. Let's write a make-believe story about what you would do if you found a magic hat. Remember, you can do or be anything you wish. Start your story like this:
One day I found a magic hat

(Print the following stem on the board)

One day I found a magic hat.

(The children should now begin. The children should be encouraged to write and to do the best they can.)

6. Concluding the assessment: At the end of 30 minutes the pupils are to stop writing and the papers are collected. Please do not edit the children's stories. Make sure each paper is identified with the student's name at the top.

7. Sending the samples in for scoring: Please complete the Writing Sample Cover Sheet and return the cover sheet and all writing samples to Wanda A. Rumson Boyer in the envelope which has been enclosed for your convenience.

8. Scoring: The writing samples will be scored by a panel of reviewers who will use a six-point holistic scoring scale.

First Grade Criteria

6
- Ideas are well developed and expressed clearly and fluently.
- The narrative is well organized and the ideas flow logically from the story starter.
- The sentences vary in structure and phrasing.
- The papers are distinguished by either an interesting plot (e.g., conflict and resolution or a surprise ending) or exceptional control of language (e. g., lively dialogue, vivid descriptions).

5
- Ideas are developed and expressed clearly.
- The narrative is fairly well organized and, generally, the ideas are logically connected.
- The sentences vary in structure but are not expressed as well as those in a "6" paper.

4
- A narrative emerges, though the story is usually not well developed.
- Papers will often show fluency but have problems in control of the language or ideas.
- The sentences probably lack variety.

3
- The ideas are apparent, but their connection to each other is loose.
- There is some sense of narrative or focus, but the development is very meager.
- The sentences probably lack variety.

2
- There is some connection between ideas even though what is written is essentially a list.
- The use of complex sentences may be the only feature that distinguishes a "2" from a "1" paper.

1
- States only one idea or wish without development or gives a list of disjointed ideas or wishes.
- If a list, the sentences are short, simple, and repetitive.

UN - Not decipherable.

BL - Blank or completely non-verbal response (picture or scribbles).

OT - Off topic. The response bears no relation to the story starter whatsoever. (Student has probably copied words displayed in the classroom).

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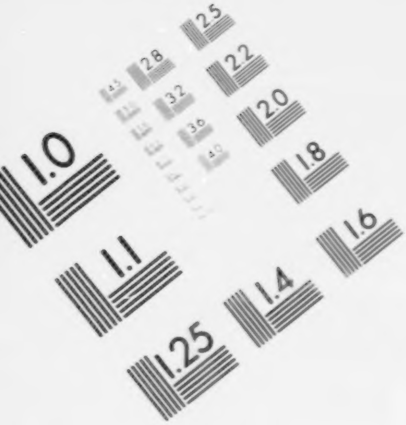
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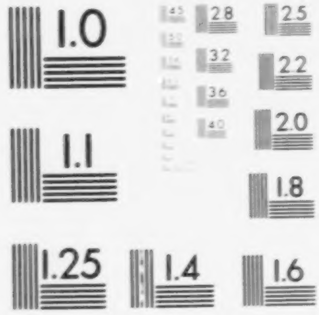
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VITA

Wanda Arleen Rumson Boyer, daughter of Gordon E. Rumson and Barbara Rumson, was born on July 15, 1957, in Montreal, Quebec, Canada. She attended public elementary school, high school, and began college in Montreal. In August of 1975, the family moved to Calgary, Alberta, Canada, where she continued her undergraduate work. From the University of Calgary, she earned a Bachelor of Education degree majoring in English in 1978, a Diploma in Educational Psychology in 1979, and an Early Childhood Services Certificate in 1981. She began her graduate studies at the University of Southern Mississippi in 1986, where she received the Master of Education degree on May 9, 1987. On August 10, 1990, she received the Doctor of Philosophy degree in elementary education with an emphasis in early childhood education from the University of Southern Mississippi.

Her professional experience in education includes seven years of teaching at the elementary, junior high, and senior high school levels within the Willow Creek School Division and for the Calgary Board of Education.

She is a member of the Early Childhood Education Council of the Alberta Teachers' Association, the Hattiesburg Area Association on Children Under Six, Kappa Delta Pi, the Mid-South Educational Research Association, the Mississippi Association on Children Under Six, the

Mississippi Reading Association, Phi Delta Kappa, and the Southern Association on Children Under Six.

Her professional activities include serving as an editor for the Calgary Association for Children and Adults with Learning Disabilities (CACALD) Newsletter from 1976-1986. From 1983 to 1986, she also co-produced and hosted several educational documentaries and talk shows which appeared on Calgary public cable television. These programs included the documentaries Kids Are Worth It, Aren't They?, Stress, Divorce, and The Missing Link, and a talk show entitled Rational Parenting: Growing Together, which won an award from the Alberta Teachers' Association. In 1985, she co-authored Body Knowledge and Care, which appears in the Alberta Health Curriculum Guide for grades 1-6. She has presented papers at the 1988 Mississippi Reading Association Conference in Biloxi, Mississippi, the University of Southern Mississippi 48th Annual Reading Conference, and an inservice session for teachers at Columbia Elementary School, Mississippi, which featured listening skills and learning centers. She has also written a number of articles which have been published in the ERIC Clearinghouse on Reading and Communication Skills, Instructor magazine, the Midsouth Educational Research Association Fall 1989 Proceedings, and the Mississippi Reading Journal.

She is married to John Michael Boyer. They are the parents of one daughter, Wanda Barbara Kathleen Boyer.